The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Imperial Chemical Position

SIR HARRY MCGOWAN, the present chairman of Imperial Chemical Industries, had an onerous duty in making his first speech from the chair to the annual meeting of shareholders on Tuesday. All who listened to it must have felt that the duty was ably and wisely discharged. The tone of the meeting itself, which was as large in numbers as usual, was naturally quiet; the Chairman's definition of the position was listened to closely, the points of improvement were promptly noted, and there were no questions of any moment. The note of the Chairman's speech was its restraint. He described very clearly the world conditions of trade, but in his closing passage carefully refrained from making any prophecies for the future. The meeting would probably have been cheered by a favourable forecast; the Chairman, however, took the safer and honester plan of placing the facts before the shareholders and declining to go further than to state that improvement in the company's position would correspond with the improvement in world trade.

This attitude is fundamentally sound. It has been pointed out again and again, as Sir Harry McGowan pointed out on Tuesday, that the chemical industry in the main does not sell direct to the general public; its products are largely "secondary commodities," forming part of the raw materials of a large number of other industries. Alkali, for example, is required by the papermaker, textile producer, the glass maker, the soap manufacturer and others. Chlorine and caustic soda find their way into consumption largely through the textile trades, particularly artificial silk. Acids are used in large volume by the galvanising trades, while lime is the raw material of the iron and steel industries. Dyes are only of service when incorporated in the products that they colour. Fertilisers must pass through the agricultural channel before their effects can reach the table of the consumer. The same considerations apply to explosives and non-ferrous metals.

All this will readily be recognised by members of the industry as an absolutely correct description of the case, and the Chairman's remarks should help to make the real facts of the situation plain to the general public. As a famous statesman once said of sulphuric acid, that it was the barometer of national trade, so the chemical industry of to-day is an index to the state of world trade, and inevitably reflects its activity or slackness.

Nothing was more interesting in Sir Harry McGowan's review than his references to trade abroad, and these contained a number of bright spots which the shareholders were not slow to appreciate. In spite of the unsettled condition in the Far East, sales in the huge Chinese market continue to grow. The profits earned in Australia and New Zealand actually exceeded those of the previous year. Canadian Industries, Ltd., had a satisfactory year, the gross sales being very little short of the previous year's figure, and the dividend only slightly less than that for 1922. The profit of African Explosives and Industries, Ltd., showed an increase for the year 1930, due mainly to increased manufacturing efficiency, as the volume done was only a little larger. The net profit for 1930 touched a new high record, and Imperial Chemical Industries benefited by a larger dividend. New works have been established in South Africa, including a fertiliser-mixing factory at Salisbury, a new superphosphate unit at Natal, a synthetic ammonia plant at Modderfontein, and plants for the oxidation to nitric acid of the resulting ammonia near Cape Town. In relation to works in this country, the chief reference was to the synthetic nitrogen works at Billingham-on-Tees. The present demand, owing to various causes, does not justify the operation of the plant to its full capacity, but it is held to be "more economical to have spare capacity than to carry excess stocks." Apart from nitrogen, however, Billingham is an enormously important centre of experiment and research, and notable progress has been made in new directions, such as the conversion of coal into petrol and fuel oil by hydrogenation.

Broadly speaking, the speech from the chair of Imperial Chemical Industries was a careful, frank, and

discriminating statement of the actual conditions. In places there seemed an undercurrent of confidence, but the chief effect of the speech was to emphasise this central fact—that the condition of British chemical industry must correspond in the main to the condition of industry throughout the world. If, as everyone hopes, a general revival of industry presently sets in, Imperial Chemical Industries has all the organisation and machinery ready to take immediate advantage of it.

The "Cosach" Issue

IT is at the moment not officially known what response London has made to the invitation to subscribe £2,000,000 prior secured 7 per cent. sterling bonds of the Campania de Salitre de Chile, or how the matter has been taken up in Holland, Switzerland, and Sweden, although the lists were closed on Tuesday morning. The company is a huge national organisation to control and direct virtually the entire Chilean nitrate industry. It has an authorised capital of £75,000,000, and ranks therefore among the world's biggest combines. It is doubtful if mere size will impress the public quite as much as it might have done a few years back, for the large-scale rationalisation process, although possessing many good and even essential points, also has its limitations.

This Chilean merger is, of course, the result of the competition of synthetic nitrogen works, which since the war have been established in several countries. The Chilean industry was obviously handicapped by the variety of its works and processes, some quite successful and some in a poor way, and it was decided to consolidate the sound concerns, eliminate the unfit, and make a united effort to save Chile's great national industry. According to the prospectus, the Chilean Government has exempted from the export duty all nitrate exported by the company and its subsidiaries, and has made available to the company government owned nitrate deposits up to 150,000,000 metric tons of recoverable nitrate. As a result of exemption from export duties and the availability of what is described as the "low cost" Guggenheim process to substantially all deposits in Chile, the company will be placed in a most favourable competitive position in international markets. Thirty-six companies and firms representing over 95 per cent. of nitrate productive capacity in Chile have expressed their intention of adhering to Cosach. If and when the adherence of the companies and firms is effected the company will own, directly and through subsidiaries, deposits estimated to contain 103,503,000 metric tons of recoverable nitrate. These deposits, together with the government deposits deliverable, will give the company reserves sufficient for over fifty years even if present production is doubled. Upon their adherence, the company will own, through the successor company to Anglo-Chilean Consolidated Nitrate Corporation, and through the Lautaro Nitrate Co., two Guggenheim process plants having annual rated capacities of 600,000 and 750,000 metric tons respectively, the former now in operation and the latter expected to begin production within three months. For the moment Chilean and synthetic producers have come to an understanding, but competition between natural and synthetic nitrogen cannot, of course, be avoided.

Mont Cenis Process Costs

INTERESTING data on operating costs for the Mont Cenis low pressure ammonia synthesis process were published in the March issue of our American contemporary, *Chemical and Metallurgical Engineering*. This data indicates a maximum hydrogen consumption of 37 cu. ft. of hydrogen for each pound of ammonia produced; a plant with a capacity of 100 tons of ammonia per day will, therefore, require about 7,400,000 cu. ft. of hydrogen per day. Assuming that a normal size coke-oven plant is in use, the heat distribution may be summarised as follows:—

	Million B.t.u.	Per cent. of Total.
Raw gas produced in making 1,000 tons coke	6,200	100
Gas utilised in heating ovens	3,400	55
Surplus gas actually available	2,800	45
Gas actually required for production of 100 tons of ammonia	2,230	36
Gas available for other purposes	570	9

Labour required to operate such a plant, comprising two 50-tons-per-day units, would include 31 men for sulphur purification, gasholders, pumps and cooling system, lye regeneration, compressor and synthesis, with an additional 30 men for gas and air separation. Six chemists would bring the personnel to a total of 67, so that with three 8-hour shifts, only 22 men per shift are required to undertake the actual operation and control of the plant. The installation costs of the existing Mont Cenis plant erected in 1926–27, for a yearly capacity of 28,000 tons of ammonia, amounted to a total of $3,100,000, which is equivalent to $111 per ton of ammonia produced per year. Costs of raw materials, power, labour, maintenance, and other fixed and supervisory charges for this plant do not exceed $50 per ton of ammonia produced.

Books Received

Reprints from the Journal of the Society of Chemical Industry. DIPHENYL: A STARTING POINT IN ORGANIC SYNTHESIS. By G. T. Morgan and Leslie Percy Walls. AQUEOUS LIQUORS FROM LOW-TEMPERATURE CARBONISATION OF COAL. By G. T. Morgan and A. E. J. Pettet. London: Society of Chemical Industry. Pp. 10.

The Calendar

Apr. 9	Institute of Metals (London Section): Annual General Meeting. 7.30 p.m.	83, Pall Mall, London.
9	Oil and Colour Chemists' Association: "Bitumens and Their Use in Paints." W. M. Bowran. 7.30 p.m.	30, Russell Square, London
10	Oil and Colour Chemists' Association (Manchester Section): Annual Meeting. 7 p.m.	Milton Hall, Deansgate Manchester.
10	Society of Chemical Industry (Manchester Section): Annual General Meeting. "The Present Position of the Thermal Decomposition of the Lower Hydrocarbons." Dr. A. E. Dunstan. 7 p.m.	17, Albert Square, Manchester.
13	Society of Chemical Industry (London Section): "Studies in the Free Air Cooling of Hot Gases in Mains." J. W. Walters. 8 p.m.	Burlington House, Piccadilly, London.
13	Ceramic Society (Pottery Section): 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent
14	Society of Chemical Industry (Birmingham and Midland Section): Annual Meeting. "Modern Methods of Sewage Disposal." F. R. O'Shaughnessy. 6.45 p.m.	Chamber of Commerce, New Street, Birmingham.

Imperial Chemical Industries: Annual Meeting

Sir H. McGowan's Review of Trade

The feature of the fourth annual general meeting of Imperial Chemical Industries, Ltd., held on Tuesday at the Central Hall, Westminster, was the exhaustive review of the company's position by Sir Harry McGowan, who was elected chairman on the death of Lord Melchett. Extracts from the speech are given below.

Our trading results (Sir Harry McGowan stated) are but a reflection of the conditions of trade which we have experienced, and I must ask you to bear with me for a few moments while I lay before you one or two figures which mark out the severity of the present industrial crisis. I shall compare 1930 with 1929, using the most authoritative figures I have been able to obtain. On this basis the volume of physical production shows a decrease in the United Kingdom of 8 per cent., in Germany 16 per cent., Canada 14 per cent., and the United States of 17 per cent., while most other industrial countries have had similar falls. The major part of this slowing down of industrial activity is due to a diminution in the export trades. Expressed in monetary values the United Kingdom shows a fall of 22 per cent., France 15 per cent., Germany 11 per cent., Italy 19 per cent., and the United States nearly 26 per cent Even eliminating the effects of the change in the price level, British exports have fallen by over 18 per cent. These figures do not, however, state the full story. So long as Great Britain is dependent upon her export trade, any given percentage fall in its volume is much much damaging to her than a similar percentage fall is to France or Germany or the United States.

World-wide Depression

The shrinkage in the volume of production has necessarily brought with it a decline in the volume of employment. Taking the latest figures and comparing them with the position twelve months before, unemployment has increased in this country by 72 per cent., in Germany by 48 per cent., in Italy by 55 per cent., in Canada by 49 per cent., in Australia by 81 per cent., and in the United States by 149 per cent. These figures prove without question how world-wide the depression is. It has been accompanied by a rapid fall in the wholesale price level of primary commodities. The Board of Trade index number of wholesale prices fell from January to December of 1930 by more than 16 per cent. for food, by 17 per cent. for materials and 17 per cent. for all commodities taken together. Stocks of many primary commodities have accumulated, which continue to press upon the price level for their liquidation. During 1930, stocks of American cotton increased 55 per cent., copper 35 per cent., tin 32 per cent., lead 66 per cent., rubber 27 per cent., coffee 22 per cent.

The products which our companies manufacture are largely what may be termed secondary commodities, that is to say, they are not consumed by the general public as such but form part of the raw materials of a large number of other industries. Alkali is required by the paper maker, the textile producer, the glass maker, the soap manufacturer and almost every staple producer. Chlorine and caustic soda find their way into consumption largely through the textile trades, particularly artificial silk. Acids are used in large volume by the galvanising trades, while lime is a raw material of the iron and steel industries. Dyes are only of service when incorporated in the products which they colour. Fertilisers must pass through the agricultural channel before their products can reach the table of the consumer. The same considerations apply to explosives and non-ferrous metals. Many means of stimulating consumption which are open to manufacturers dealing more directly with the individual consumer are closed to us because our demand arises at the intermediate stage of production. We are thus mainly moved by forces which we cannot control. Our chief effort is devoted to the dual task of ensuring that our products are of the highest quality thoroughly fitted to perform the services required of them, and that in their production the utmost economy and efficiency are practised.

The Dyestuffs Industry

Since we met last year the Dyestuffs Act has been renewed until December 31, 1931. I feel that in taking this action Parliament has acted very wisely. The dyestuffs industry, although neither large in respect of its turnover nor particularly remunerative to those engaged in it, renders a great national service, and I hope that nothing will be done to hinder its continued development in this country. For this reason I regret that the suggestion of a further inquiry proposed in Parliament has not been adopted by the Government.

World competition last year was very severe, but I believe that insane price cutting is ceasing so that producers all over the world are beginning to co-operate more with one another, to their mutual benefit. The quality of our dyestuffs is now unquestioned, and our prices continue to be steadily reduced *pari passu* with the development of research and the growing efficiency of production. We are not unmindful of the difficulties of the textile trades, and we feel a responsibility for keeping prices as low as possible in order that we may contribute to their revival.

The Fertiliser Industry

In 1930 the index of prices for agricultural products showed a drop of 22 per cent. in the principal countries of the world. The farmers' purchasing power fell away and the great increase in the use of nitrogen fertilisers of recent year was arrested. For this reason our output of sulphate of ammonia at Billingham has been considerably below capacity in recent months. This situation was accentuated by the sulphate made as a by-product by gas, coke oven and other undertakings necessarily having the first claim on the impaired markets.

Large-scale manufacturers like ourselves will always have to face periods during which demand does not keep our works fully occupied. That is the price we have to pay for being ready to meet the demand when it does come. Generally speaking, in the chemical industries, it is more economical to have spare capacity than to carry excess stocks. The demand for nitrogen fertilisers will certainly continue to increase when world conditions become more normal again.

This condition of the nitrogen industry appears to have given rise to many baseless rumours about our Billingham factory. It is said, for instance, that these works are about to be closed down entirely, that only a trifling use is being made of the existing capacity, or that this large plant is already out of date. Allegations of this kind are equally untrue. Naturally, we are much concerned to see some of our most modern plant operating on a scale of merely partial production, but it must be remembered that when we embarked nearly three years ago upon the extension of our nitrogen plant, that action was fully supported by the study of the market situation which was then made. The additional manufacturing capacity created would have been in full operation to-day had not the balance between supply and demand for agricultural products been abruptly broken by a great increase in agricultural productivity leading to an unprecedented fall in market prices. The situation has been aggravated by the absurd lengths to which economic nationalism has been pushed by the erection of new plants in many of the smaller European countries on the ground that they must be self-contained in this branch of production.

Our relations with the largest makers in the world—the I.G. Farbenindustrie and the German Nitrogen Syndicate—continue to be satisfactory. As a direct result of the friendly co-operation between our companies an agreement was arrived at last summer between the principal European nitrogen producers. This agreement, known as the Nitrogen Industry Convention, to which the Chilean producers are also parties, was entered into for a preliminary period of one year with a view to arriving at a more permanent basis for the future. The agreement has had the effect of regulating synthetic production to demand, of stabilising prices for nitrogen at a rather lower level than obtained during the previous fertiliser year, and of providing orderly marketing arrangements. The interests of both consumers and producers have thus been safeguarded. Discussions are now proceeding for the future regulation of the industry, which, I trust, will prove successful.

Our own nitrogen works are equipped with absolutely

modern plant of the highest efficiency, capable of production at a cost which we believe to be lower than that of any other world producer.

In speaking of Billingham, it is essential that you should realise that these works are much more than a producer of fertilisers. They are the home of our latest and most modern plants for the manufacture of nitrogenous products for other than agricultural purposes and of a variety of other chemicals, notably metallic sodium, sodium cyanide, methanol, electrolytic caustic and chlorine and acetic acid. The demand for these products forms part of our general chemical business and is not affected by the depression in the fertiliser industry.

Of the other fertilisers we make at Billingham, the agricultural value of nitro-chalk is being more and more widely recognised, both at home and abroad, and our new concentrated compound fertilisers manufactured from ammonium phosphate are now on the market. There are six complete fertilisers containing nitrogen, phosphate and potash, and four others containing nitrogen and phosphate.

Foreign Export Markets

Over the past four or five years' our companies' export trade has shown a marked expansion. The secret has lain in the establishment of our own widespread selling organisations in the respective markets. Our 1930 trade in foreign markets was affected by numerous adverse conditions. In India there was the boycott of British goods. In China a continuance of disturbed conditions accompanied by the precipitous fall in the value of silver has not only made selling more difficult, but also introduced a factor of uncertainty in the fluctuations of exchange. Nevertheless, our sales in that huge market continue to grow. In Japan conditions were also difficult. In South America purchasing power and general prosperity have been severely affected by the fall in the value of agricultural produce.

Russian competition has begun to affect our trade, particularly in the Far East and South America. Communistic in its base, this competition rests upon labour conditions and a standard of living which have no parallel in any other country carrying on international trade. It is fired by the necessities of the Five Year Plan and in its relations to international markets is setting aside every normal economic force. If the Soviet State Trade organisations persist in the course they are at present following, their competition will become a menace to the economic stability of other nations. No one desires to deny a welcome to the return of Russia to the international market. A rise in her standard of living would add to world prosperity and simultaneously absorb much of her own new production. If that movement is stifled, dumping competition carried to extremes runs the danger of provoking common action by the great industrial nations of the world designed to protect their own trade against export methods which appear to be inspired more by bad feeling than by good.

Empire Export Markets

During the past two years our interests in Australia have been entirely reorganised and consolidated in the hands of an Australian company—Imperial Chemical Industries of Australia and New Zealand. The former companies of Nobel (Australasia), Ltd., and Brunner, Mond and Co. (Australasia), Ltd., dealing respectively with explosives and chemicals, have become subsidiaries of that company. Our interests in fertilisers have been consolidated with those of other Australian manufacturers. Provision has been made for joint development for the manufacture of nitrogenous fertilisers when the demand for this product reaches a level which will justify domestic manufacture; 1930 was the first complete year in which I.C.I. fertilisers were available in the Commonwealth, and sales were well up to estimates. Similar steps have also been taken to consolidate the various interests in Australia for the manufacture and sale of ammonia for various industrial uses.

Imperial Chemical Industries of Australia and New Zealand earned profits in excess of the previous year. Their year terminated at September 30, 1930, so that their trading results were only partially affected by the abnormal drop in the prices of primary products. The same rate of dividend was paid as for 1929. While the volume of trade in explosives and heavy chemicals showed some decrease, the effect was offset by manufacturing economies. The recent financial crisis has led to great difficulty in securing remittances from Australia, so that we have been subject to the enforced accumulation of moneys there—a position which cannot continue indefinitely. I have every confidence that Australia will in due course emerge from her present economic difficulties, and regain sound financial conditions. When recovery has been made there is no doubt that our Australian business will continue to expand.

In Canada the depression extended throughout the year. Official statistics show that the value of Canada's field crops fell in 1930 by 34 per cent., and that of her mineral production by 11 per cent. This represented a fall in purchasing power of no less than £70,000,000 sterling. Nevertheless, Canadian Industries, Ltd., supported by the combined technical and commercial strength of your company, and E. I. du Pont de Nemours and Co., had a satisfactory year. Gross sales fell very little short of the preceding year, and its dividend was only slightly less than that for 1929.

The profits of the South African company, African Explosives and Industries, Ltd., jointly owned by the De Beers Co. and ourselves, showed an increase for the year 1930, due mainly to increased manufacturing efficiency as the volume done was only a little larger. The net profit for 1930 touched a new high record, and we benefited by a larger dividend. South Africa is perhaps fortunate in that she produces the one commodity which is at present rising steadily in value, viz., gold. The 1930 record production from the Rand Mines naturally maintained the demand for explosives. The fertiliser industry that has been built up by the African company during the past ten years is experiencing a difficult period owing to the fall in demand on account of the financial position of the South African farmer. A new fertiliser-mixing factory has been opened at Salisbury, Rhodesia, and the trade in that territory shows a gratifying increase. At the Natal factory a further superphosphate unit is now being added. A synthetic ammonia plant, sufficient for local demands, is being built at the factory at Modderfontein, outside Johannesburg, and plants for the oxidation to nitric acid of the resulting ammonia are being erected at the same works as well as at Somerset West, Cape Town. The use of these modern processes will greatly reduce cost. When the present agricultural depression passes, a resumption of the steady increase in the demand for fertilisers in South Africa may be looked for. Close connections have been established with the development of mining in Northern Rhodesia. The day will come when this development will necessitate the erection of a new factory in Northern Rhodesia for explosives and other products required by the mines.

My previous remarks will have made clear to you how closely the manufacturing activities of our subsidiary companies are interwoven with the general level of world prosperity. I have also given to you some key figures measuring the severity of the present industrial depression. When these two factors are brought together no other explanation of the fall in the net profits of the company is required. You will on the contrary, I think, not dissent from the view that our 1930 profits have been maintained in a not unsatisfactory manner. Our trade was well maintained during the first half of 1930, and, when the announcement of the interim dividend was made last August, we did not expect the sudden contraction in general business which developed during the latter part of the year. As events proved, we were optimistic in our hope of escaping the full blast of the "economic blizzard."

Research

Our annual expenditure upon research work is heavy. Research, however, is an essential activity of the chemical industry, and unless it is pursued unceasingly, we cannot hope to maintain our position in the forefront of world enterprise. The effect of our consistent research policy shows itself in three directions. First, alternative processes are worked out for the manufacture of existing products, while other allied products are also developed. For instance, we have begun or are about to begin, the manufacture of a large number of products not previously made in this country. These include synthetic acetic acid, tracer shot gun cartridges, various products from waste gases, nitro-cellulose plastics for linoleum, the new concentrated fertilisers I have mentioned, and a large addition to the range of our dyestuffs. Secondly, it contributes to a reduction of costs, and thus tends to preserve the margin of profit which is constantly being encroached upon by the downward movement of the market prices which our commodities command. Thirdly, it solves problems put to us by

other manufacturers, in connection with the application of our products to the manufacture of their goods Finally, it serves gradually but persistently to perfect existing processes of manufacture by the elimination of small but troublesome difficulties, so leading *in cumulo* to a marked improvement in the final efficiency of the product.

We are prosecuting an unremitting search for manufacturing economies. We have extended that enquiry to our administrative organisations. Every expenditure that cannot be fully justified is being eliminated.

Our relations with all our employees and workers continue to be of the most friendly description.

Oil from Coal

Lord Melchett told you last year that a pilot plant for the conversion of coal into petrol and fuel oil by hydrogenation had been put into operation. During the year which has since elapsed further research work has been continuously carried out, which has resulted in major improvements and development of the process. This work represents a remarkable development in the very difficult technique of high pressure synthesis, a complex field in which many of the future major developments of the chemical industry will be found, and one in which we are adding to our knowledge continuously. As a result of our work during the past year we have secured a marked fall in the working costs of the coal-oil process. The quality of the petrol produced is beyond question. It is equal in its anti-knock qualities, for instance, to the finest grades at present on the market. So far as we are aware, we are the only company in this country or the Empire which has brought to a successful conclusion the difficult technical operation of hydrogenating coal into petrol with but a small residue of waste product of no value. Our process has nothing in common with low temperature carbonisation processes, which produce small quantities of liquid fuel as a by-product only. The eventual establishment of this industry in Great Britain, I need hardly add, will be of immense significance in the protection of the national economic and strategic positions.

The Company's Prospects

All experience proves that the process of emergence from a period of industrial depression is normally longer than that occupied by the descent. It is, however, equally certain that industry does at length recover, although no one seems able to forecast the moment at which convalescence will begin. Stocks of commodities form the great shock absorbers of depressions. Without stocks ready to be put either into the processes of manufacture as raw materials or into consumption as immediately available for use, ordinary business cannot be carried on. Stocks are, therefore, an essential ingredient in modern production. Whatever their nature—raw materials, stores and spares, or finished goods—they should, however, be kept at a minimum. There is no outlet through which capital can be more wastefully employed.

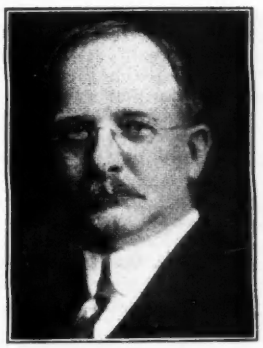
In our case the merger has permitted of permanent economies in this direction which are consistently maintained through a strict and continuous scrutiny of all stocks. But stability in the volume of stocks cannot be obtained without a fairly stable price level. A fall in prices is the signal for the consumption of stocks, and their reduction to a minimum level, not only by every class of manufacturer, but by merchants, retailers and even consumers. Everyone works within narrower limits. The moving force is an anticipation, when the price level is falling, that it will move still lower. Only by this contraction of stocks can the consequential losses be minimised. On the other hand, when the turn comes from depression to revival, there is a precisely contrary movement. Rising prices hold out hopes of rising profits, which lead to a restoration of stocks.

Recent months have afforded some evidence that the fall in the price level has slowed down. Within a short period an upward trend may appear. Prospects in 1931 depend upon this movement. For the first two months our volume of business compares favourably with the average of the later months of 1930. The curves of industrial activity in 1931 will reflect the degree of confidence in the stability of prices at home and abroad. Political movements and the readjustment of adverse budgetary positions, the possibility of co-operation in the control of the world's currency systems, the forced development of German and Russian competition, and other clouds on the industrial horizon, present such inscrutable problems as make forecast hazardous.

You will, therefore, understand if I refuse to prophesy the results that we shall show this year. It will be sufficient to assure you that we shall continue to search for efficiency and economy. The dividend for 1931 depends almost entirely on the volume of business secured and the movement of prices. The products that our companies manufacture lie close to the core of the world's manufacturing and consumption needs. Few, if any, of them are luxury articles. On the contrary, they are essential ingredients of the necessaries of civilised life. Our structure was never sounder. Our organisation is elastic and virile. It is served by plants of the highest efficiency, by the most skilled and loyal body of workers that any industrial unit can wish for and by an administrative staff—technical, commercial, financial and otherwise—which is hard-working, full of initiative and enthusiasm and devoted to its work of upholding the high reputation of British products at home, in the Empire, and in every international market.

American Chemical Society Leaders

BELOW we publish photographs of Dr. Charles L. Reese (left) who has been elected chairman of the reorganised board of directors of the American Chemical Society, and Dr. Charles



L. Parsons (right) who, after occupying for many years the post of secretary of the society, has been appointed its business manager. Dr. Reese will be remembered for his long association with the du Pont Co., at Wilmington, U.S.A., and his interest in chemical engineering. He accompanied the American chemical engineers when they visited this country a few years ago, and was a prominent figure in the party which toured Canada and the United States in 1929. Dr. Parsons' career is already familiar to readers of THE CHEMICAL AGE. He has been closely identified with the splendid development of the American Chemical Society in recent years, and for a long time the welfare of the society has been his major concern in life.

Kelp for Iodine Production

Irish Free State Enterprise

THE Irish Free State Government, who are developing the production of kelp from seaweed for the manufacture of iodine have sent an inspector to Brittany to inquire into the methods employed there for the handling of winter-gathered weed. It has been decided that the factory established in Galway for the manufacture of iodine shall no longer purchase kelp made by the burning of the weed in trenches in the sand, but it should all be burnt in kilns of the raised type which are being provided by the Government.

The Sea Fisheries Association, which has been formed under the direction of the Minister for Lands and Fisheries, will probably be undertaking the marketing of a large proportion of the kelp produced in the Free State during the next season, and this organisation may also be asked to market the Carrigeen moss which is gathered along the western coast of Ireland. This moss forms an excellent jelly and is used as a curative for ailments in many parts of the country. The government are establishing stations for the proper cleaning and packing of the product, and it will shortly appear on the market. Instructors have also been appointed by the Free State authorities with a view to teaching the seaweed gatherers the best methods of drying and preparation for burning.

Chemical Society's Annual Meeting

Professor Henderson Succeeds Professor Thorpe

THE annual general meeting of the Chemical Society was held in the Society's Rooms at Burlington House on Thursday, March 26, the President (Professor J. F. Thorpe) being in the chair.

Referring to the statements of accounts contained in the report of Council, which was presented by the President, the Treasurer expressed his concern regarding the increased expenditure incurred on publication and appealed for the support of those chemists engaged in industry.

Professor Thorpe's Address

After votes of thanks had been passed to the Officers Auditors, Council and Committees for their services during the past year, the President recalled the circumstance in which last year he had agreed to fill the presidential chair for a further period, stating that he accepted on the condition that he should be free to resign at the end of the first year of the new term of office. He mentioned that the Association of Scientific and Technical Institutions had been formed during the past year, and referred to the importance of this step to all those concerned. Professor Thorpe stated that his presidential address was divided into two parts; the first part being entitled "A Retrospect," and the second part "The Outcome of Some Recent Research Work."

After the first part of the presidential address had been delivered, Professor Wynne, in proposing a vote of thanks to Professor Thorpe for his services in the chair during the past three years and for his address, referred to the President's work in connection with the Central Building and to the eminent services rendered by him to the Society and to the assistance given by Mrs. Thorpe. In acknowledgment, Professor Thorpe, answering a question regarding the scheme for a central building, stated that though the present difficult financial position of the country might mean delay, the scheme would be carried out.

Election of Officers

Professor G. G. Henderson was then declared elected as President and was conducted to the chair by Professor Thorpe. Professor Henderson expressed his sincere thanks to Fellows both present and absent, for conferring upon him the honour. He then announced the names of those nominated to office on the Council, namely: Professor H. E. Armstrong and Professor J. F. Thorpe as vice-presidents (who have filled the office of president), Dr. F. A. Freeth and Dr. R. H. Pickard as vice-presidents (who have not filled the office of president), Dr. C. R. Bailey, Dr. C. R. Harington, Professor W. N. Haworth, Dr. J. Kenyon, Dr. G. A. R. Kon, Dr. I. S. Maclean, Mr. J. Davidson Pratt and Professor F. M. Rowe as ordinary members of Council.

At the invitation of the president, Professor Thorpe, on behalf of some twenty subscribers, asked Dr. M. A. Whiteley to unveil a portrait in oils of Thomas Graham, who was the first president of the Society. The portrait had been painted by Mr. H. A. Budd, R.O.I., from a lithograph by W. Bosley, which was made from a daguerrotype by Claudet.

The Society's Annual Dinner

Distinguished Foreign Guests

THE anniversary dinners of the Chemical Society—and we have attended a good many now—always leave one with the feeling that among gatherings of this kind they have quite a place of their own. What the distinction is it is difficult to say, but there is something peculiarly satisfying in these meetings with some of the most distinguished scientists of our own and other countries, full of a common interest in their science, and constituting a fellowship of workers in the search for physical truth. The international note no doubt adds to the interest and distinction; it reminds one how the scientific interest overflows the barriers of race and country, and it introduces one to people long known by name, but rarely met personally. But it is the social spirit that mostly explains the pleasure—the sense of an agreeable dinner party whose members can enjoy one another's company and listen to a few informal and unpretentious speeches.

It was the 90th anniversary dinner this year. The guests were received in the fine rooms of the Hotel Victoria by Professor G. G. Henderson of Glasgow, newly elected to the chair of the Society in succession to Professor Thorpe, and Mrs. Thorpe was good enough to assist him by adding her customary gracious welcome. The new President, of course, took the chair. The toast of the Society was proposed by Lord Blanesburgh, who spoke rather as a cultivated visitor than as one familiar with the Society's work from within. Professor Henderson, in replying, began with a tribute to his predecessor, and his valuable work in connection with the Chemistry House scheme, and quoted again that historic phrase of Professor Thorpe's that "we must expand or burst." Professor Henderson in pointing out the need of closer co-operation between the chemical organisations, remarked that absolute amalgamation might not be possible, but many of them desired to see something like a common membership. The junior members of the profession often could not afford to belong to more than one body, although interested in the work of others.

Sir William Pope, who proposed the other toast "The Guests," gave us a series of delicately etched character sketches of the principal foreign visitors and welcomed them in a truly international spirit—Professor Ernst Cohen (University of Utrecht), Professor Marcel Delépine, president of the Chemical Society of France, and Professor J. A. de Artigas, president of the Federation of the Chemical Societies of Spain. It was a compliment to the chemical engineers to include with these—we think for the first time—the newly elected President of the Institution of Chemical Engineers, Mr. W. A. S. Calder.

Each of the guests associated with the toast made a brief reply. Professor Cohen is by this time an old friend, and understands English chemists so thoroughly that he might almost be mistaken for one. This year he brought no chemical caricatures with him from his interesting collection, and instead of quoting from his beloved Shakespeare, he fell back on another master of English, Professor Armstrong, and told us something of what the grand old man had been saying about chemical heredity. Though not on the list, he included a gracious reference to Mrs. Thorpe and the company very readily rose and drank her health. Professor Delépine responded rather more formally with a speech that he read in his own tongue. Professor Artigas, apologising quite needlessly for his English, which was excellent, drew a very pleasant picture of the attractions of Madrid where there is to be an important international gathering, and assured us that whatever the political conditions might be the chemical delegates might feel assured of a cordial welcome. Things, he remarked dryly, even in Spain were not always as bad as they were reported to be. Mr. Calder contented himself with an acknowledgment of the Society's kindness in recognising the importance of chemical engineering, and telling one of the best Ford stories we have heard.

So the 90th anniversary dinner came to an end, and the guests departed well satisfied with another pleasant and dignified evening.

Some of the Guests

Dr. E. F. Armstrong, F.R.S., chairman of the Association of British Chemical Manufacturers, and Miss N. Armstrong; Professor J. A. de Artigas, president of the Federation Espanola de Sociedades Quimicas; Mr. and Mrs. Julian L. Baker; Dr. E. C. S. Biilmann, president of the Union Internationale de Chimie; Rt. Hon. Lord Blanesburgh; Mr. and Mrs. E. R. Bolton; Mr. W. A. S. Calder, president of the Institution of Chemical Engineers; Mr. and Mrs. A. Chaston Chapman; Lt.-Col. E. Kitson Clark, T.D., president of the Institution of Mechanical Engineers; Dr. G. C. Clayton, president of the Institute of Chemistry; Professor Ernst Cohen and Madame Cohen; Mr. J. H. Nelson Curtis, Prime Warden of the Dyers' Company; Professor M. Delépine, president of la Société Chimique de France, and Mademoiselle Delépine; Professor F. G. Donnan, F.R.S., foreign secretary of the Chemical Society, and Miss J. E. Donnan; Dr. J. T. Dunn, president of the Society of Public Analysts, and Mrs. Dunn; Dr. A. E. Dunstan, president of the Institution of Petroleum Tech-

nologists; Mr. Cyril Eastman, president of the Society of Dyers and Colourists; Dr. and Mrs. F. A. Freeth; Mr. Percy Gates, president of the Institute of Brewing; Professor C. S. Gibson, secretary of the Chemical Society; Sir William H. and Lady Hamer; Mr. Noel Heaton, president of the Oil and Colour Chemists' Association; Professor G. G. Henderson, F.R.S., president of the Chemical Society; Mr. T. A. Henry, chairman of the Executive Committee of the Biochemical Society, and Mrs. Henry; Professor J. W. Hinchley; Mr. J. G. Lawn, president of the Institution of Mining and Metallurgy; Dr. H. Levinstein, chairman of the Council of the Society of Chemical Industry; Mr. C. McDermid, hon. secretary general of the Empire Council of Mining and Metallurgical Institutions; Mr. Eric Macfadyen, president of the Institution of the Rubber Industry; Mr. G. S. W. Marlow; Sir David Milne-Watson, president of the Institute of Fuel; Mr. H. Eustace Mitton, president of the Institution of Mining Engineers; Mr. and Mrs. Emile S. Mond; Professor J. C. Philip, F.R.S.; Dr. R. H. and Mrs. Pickard; Sir William J. Pope, F.R.S., past president and president of the Federal Council for Chemistry; Captain and Mrs. J. Davidson Pratt; Dr. T. Slater Price, F.R.S., treasurer of the Chemical Society; Dr. E. K. Rideal, F.R.S.; Sir Robert and Lady Robertson; Professor R. Robinson, F.R.S., and Mrs. Robinson; Dr. R. Seligman, president of the Institute of Metals; Professor F. Swarts, University of Ghent; Professor J. F. Thorpe, F.R.S., past president of the Chemical Society, and Mrs. Thorpe; Professor W. P. Wynne, F.R.S., past president of the Chemical Society; Mr. S. E. Carr, assistant secretary of the Chemical Society; Mr. Clarence Smith, editor of the Chemical Society's Journal; Mr. A. D. Mitchell, assistant editor of the Chemical Society's Journal; Mr. F. W. Clifford, Librarian, Chemical Society; Mr. T. S. Moore, hon. secretary of the Chemical Society.

Concentration by Submerged Combustion

Discussion on Mr. C. Featherstone Hammond's Paper

Below we give a report of the discussion which followed the reading of Mr. C. Featherstone Hammond's Paper on "The Concentration of Phosphoric Acid by Submerged Combustion" before the Institution of Chemical Engineers in London on March 24. A demonstration of the plant preceded the paper, extracts from which were given in our last issue.

DR. W. R. ORMANDY said the problem of evaporating corrosive liquids by means of the submerged burner was first tackled by Brunler, the father of the present Brunler, who designed a plant for the concentration of sulphuric acid which was worked by one of the German chemical companies in 1914, making use of a simple circulating system and an inverted burner. The whole plant was coated with acid resisting tiles set in acid resisting cement. That, however, applied only to sulphuric acid and he had no record of it ever having been used with phosphoric acid. It appeared from tests that submerged combustion was more perfect than would be obtained in the cylinder of an internal combustion engine working with a gas of equal value. Very few people who had not had an opportunity of carrying out experiments, realised what a tremendous effect cold working or working of any description had on steel. It was quite possible to have a sample of steel which had been pressed into a flange and to find that whereas the parts above and below would stand up against corrosion quite well, the portion which had been bent would corrode away in an incredibly short space of time. Quite recently in connection with another organic acid he found steel containing 1·3 per cent. of molybdenum, in addition to nickel and chromium, which withstood the action of boiling acid for months but the omission of the molybdenum caused the steel to dissolve under the action of the boiling acid almost like sugar in water. A fortnight was sufficient to remove the whole of the steel. Personally, continued Dr. Ormandy, he was a great believer in submerged combustion. For the evaporation of such liquids as sulphide sludges and zinc chloride bodies which tended to form deposits on the heating surfaces employed, when the heat had to be transmitted through these surfaces, there might not be a very great future for it, but in the evaporation of cheaper liquids—he was not speaking particularly of phosphoric acid—if it were possible to combine the evaporation with the simultaneous production of a steam-air-gas mixture under pressure for the production of power, there was a very great advantage in submerged combustion. If we could regard the evaporation as being the work that was done, then any power produced was a by-product, or, on the other hand, if the system was used for the production of power, then the evaporation was the by-product.

Higher Concentrations

Mr. P. Parrish said we should find solutions to many phosphoric acid problems if there were some means by which we could reduce the solubility of calcium phosphate in phosphoric acid. Calcium sulphate was appreciably soluble in weak concentrations but as the concentration increased the calcium sulphate fell out of solution and it was that nucleus of calcium sulphate falling out of solution that aided the formation of metaphosphates and reduced the efficiency of so many processes of evaporation. The question of the evaporation of phosphoric acid must also be approached from the point of view of the manufacture of phosphoric acid of higher concentrations than had hitherto been possible with ordinary methods. It was not a difficult matter to-day to manufacture phosphoric acid of concentrations up to as high as 35·36 and even 38 per cent., by working with stronger sulphuric acid and using a certain amount of phosphoric acid. Along these lines it seemed quite possible to develop a system of manufacture of phosphoric acid of higher concentrations and avoid external evaporation and thus lead to the production of a double superphosphate which, when treated in a certain way, would give the granular product which had been required by industry but had not yet been obtained. Sufficient work had been done, however, to indicate clearly that that was a direction in which development would proceed.

Stoneware and Enamelled Plant

Capt. Goodwin said all those who had witnessed the demonstration of the plant during the afternoon had been impressed by the excellent pieces of stoneware which to everybody's regret had not been made in this country. Personally, he happened to know a good deal about that particular stoneware and it was a curious thing that some of the materials used in its manufacture came from Poole in Dorset. During the war a firm at Parkstone started using some of those materials and obtained a stoneware, the composition and properties of which were very similar to the stoneware used by Mr. Hammond, and it was only due to the fact that the chemical industry in this country had not really developed to the same extent as on the Continent that that particular manufacture of stoneware had not been continued. It was really the body that was important and not the glaze. At the same time, the methods of mounting the stoneware and getting the tolerances with regard to dimensions played a very important part in the author's apparatus. It was rather surprising that it was not possible to use one of the more modern types of enamelled cast iron plant because he happened to know that for certain phosphoric acid work there were enamels available to-day which would stand up quite satisfactorily. He was not aware where there would be any technical or commercial advantage in using such materials in this particular case, but he felt that there had been insufficient attention given in the chemical industry in this country to the proper study of enamelled plant.

Mr. H. Talbot referred to the working of the apparatus and asked if it was any part of the design that the gas should break up into large numbers of small bubbles, because presumably the rate of evaporation was very much increased as a result. The author had stated he had some means whereby, if something happened to the flow of fuel-gas and air through the burner, the refractory zone of the burner was not affected by the inrush of water. It seemed to him that it required a tricky arrangement to prevent that, because apart from the pressure which was keeping back the water there was the reduction of

temperature which would take place and that in itself would tend to make the liquid suck back into the burner.

Mr. W. J. A. Butterfield said he had the impression that more of the combustion than Mr. Hammond had mentioned in his paper, took place outside the burner chamber and for that reason the lining material of the burner chamber was probably not subjected to quite such drastic conditions as Mr. Hammond had mentioned.

Oil or Coal Gas

Dr. Ormandy asked to what extent combustion took place before the flame went out of the burner. Was the combustion for the main part complete in the tube itself. In the Brunler type of burner the combustion was really carried out to the greatest extent outside the burner, one reason being that in the Brunler apparatus oil was used as against coal gas. As there were representatives of the gas industry present it might be well to remark that at the present price of fuel it was possible to get a British thermal unit very much cheaper from oil than from coal gas, even where the price of gas was as cheap as it was in London. The price of a ton of oil was, say, £3 or 3d. per gallon. The gallon was roughly 10 lb., *i.e.*, 200,000 British thermal units or 2 therms for 3d., so that although the problem of burning oil in an internal combustion burner was more difficult than burning gas, when it came to the evaporation of large bulks of cheap liquids, probably oil would be used. Another point was that he feared the whole phosphoric acid concentration problem would be seriously affected by the new methods which were being employed for the production of P_2O_5 by means of blast furnace reactions with calcium phosphate, particularly in conjunction with felspar, with the object of getting potassium phosphate as a volatile medium.

Dr. W. Cullen said the feature of the Hammond plant was the very low capital outlay per ton of phosphoric acid per annum. Mr, Hammond had mentioned a figure of between 21s. and 22s. in this connection and for a valuable product like that it was a very low capital outlay indeed. Moreover, when one remembered all the ancillary parts to the apparatus the whole plant was exceedingly compact.

Author's Reply

Mr. Hammond replying to the discussion, said the effect of cold working upon special steels was most marked. In order to get an absolutely uniform condition, it was much better to be able to normalise the whole of the piece after completing fabrication and so get everything in the condition which the steel maker recommended in order to prevent corrosion. It almost seemed that if Mr. Parrish had his way ultimately submerged combustion would be wiped off the face of the earth as regards the concentration of phosphoric acid, but he was inclined to think a good deal of water would flow over the mill wheel before that happened. He knew personally of very big projects which had been put forward for dealing with phosphoric acid on the basis mentioned by Mr. Parrish and the people who were the main protagonists for that particular process still required the Hammond plant or somebody else's plant, although they did not say what reason. Another question raised had been why he did not use some of the excellent enamelled ware which would stand up to phosphoric acid. He knew that such things were available and that it was possible to get small pans which would stand up to all sorts of long tests, but when it came to a large piece of apparatus of special form, the makers did not seem to care to tackle the job. They asked to be excused just as the stoneware people in this country did.

Regent Chemicals, Ltd.

At a statutory meeting of the creditors of Regent Chemicals, Ltd., Edinburgh, a statement of affairs was submitted showing ranking liabilities of £1,564 3s. 2d., and net assets of £469 18s. 11d., or a deficiency of £1,094 4s. 3d. The goodwill, trade marks and patents were valued in the books at £1,000, but nothing had been set down in respect of them at the moment. It was reported that the company commenced trading in February, 1929, and the present position was due to shortage of working capital, and the bad trading conditions. A resolution was passed confirming the appointment of Mr. F. W. Campbell, of 18, Melville Street, Edinburgh, as the liquidator, with a committee. It was also decided that the business should be continued.

Patent Acts Amendments

Changes Recommended by the Departmental Committee

The Report of the Departmental Committee on the Patents and Designs Acts and practice of the Patent Office, the appointment of which was announced on May 22, 1929, has now been published.

The Committee were appointed by the Board of Trade in May, 1929, to consider and report whether any, and if so what, amendments in the Patents and Designs Acts, or changes in the practice of the Patent Office, are desirable. Its membership was as follows:—The Rt. Hon. Sir Charles Sargant (Chairman), Mr. H. Ballantyne, Mr. H. A. Gill, Mr. E. H. Hodgson, C.B., O.B.E., Sir Herbert Jackson, K.B.E., F.R.S., Sir William Jarratt, Mr. Fearnley Owen, Mr. J. G. Weir, C.M.G., C.B.E., and Mr. J. Whitehead, K.C.

The Committee find no general demand for any alteration of the basic principles underlying the existing law in this country in relation either to patents or to designs, but recommend a large number of amendments in the Acts, some of which they regard as important and such as to justify early legislation.

Among the more important recommendations are:—

(1) An extension of the area of the official search as to the novelty of inventions for which patents are sought. The Committee recommend the adoption of a scheme by which the statutory duty now imposed upon the Patent Office of searching through the specifications of British patents published within the previous 50 years should remain, but the search would not necessarily be restricted to those documents. The examiners would be at liberty, acting under the directions of the Comptroller, given either generally or in any particular case or class of cases, to make search in any other documents (including foreign specifications) or books which might offer any prospect of containing anticipations of the invention in question. The Committee came to the conclusion that such a search, under well-informed direction, would be as adequate and useful as that undertaken by any other country.

(2) Drastic amendments of Section 32 (which deals with the power of the Court in infringement actions to grant relief in respect of particular claims) in order to avoid or mitigate the difficulties and abuses that have arisen as a result of the enactment of the section by the Patents and Designs Act, 1919.

(3) The strengthening of the law relating to groundless threats of legal proceedings in regard to patents.

(4) An amendment of the law in order to remove the grievances which exist among inventors in the fields of chemistry, medicine and food, that invention in these fields is being unduly hampered by reason of the operation of Section 38A(1) of the Acts.

(5) The appointment of a Judge of the High Court as the tribunal for hearing those appeals from the Comptroller in Patent cases that are now heard by the Law Officer. The Committee further recommend that the persons who at present have audience before the Law Officer should have audience before the Judge, and that these changes should not constitute these proceedings High Court proceedings.

Among the more important proposals which were placed before the Committee in evidence, but which they do not recommend for adoption, were:—

(*a*) A proposal to introduce into the industrial property laws of this country a new form of monopoly in respect of "Useful designs" or so-called "Short-term patents." (Here the conclusion of the Committee is that the risks of hampering industry outweigh the possible advantage to individuals from introducing such a form of protection.)

(*c*) A proposal that the jurisdiction of the Comptroller should be extended in order to enable him to try comparatively simple patent actions in regard to infringement and invalidity. (Although the majority of the Committee is opposed to this suggestion, a substantial minority favours such an extension of the Comptroller's jurisdiction, mainly because of the need for providing some less costly method of settling disputes relating to patents than at present obtains.)

Copies of this Report (Cmd. 3829) are obtainable from H.M. Stationery Office, or through booksellers, price 1s. 6d. The minutes of evidence taken before the Committee will be published in the course of the next few weeks.

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Chemical and Metallurgical Corporation

A Small Profit for the First Time

THE ordinary general meeting of the Chemical and Metallurgical Corporation, Ltd., was held on Thursday, March 26, at River Plate House, London.

Dr. E. P. Andreae (the chairman) said that the report and accounts indicated considerable technical and commercial progress, while at the same time they demonstrated the need of a drastic reorganisation of the company's capital. In reviewing the balance sheet he pointed out that, after deducting the balance from profit and loss account for the year under review from the 1929 suspense account figures, an addition of £63,413 was recorded. All the items making up this last sum were non-recurring and, with the exception of the special provision for fall in metal values, arose directly out of works reorganisation and litigation. As to the profit and loss account, attention had already been drawn to the fact that no provision for depreciation of buildings, plant and machinery had been made in the accounts for the year, and with this qualification a net profit of £8,003 was shown. Inclusion of a normal figure for depreciation based on present balance sheet values might have led to misconception as to the directors' idea of present actual values, which could only be properly adjusted by capital reorganisation.

Last year when he addressed the shareholders legal proceedings were pending between the company and Mr. Stanley Smith, a former managing director. He was pleased to say that this litigation had been disposed of on mutually satisfactory terms, which included the rescission of Mr. Smith's various agreements with the company. The directors were convinced that a settlement out of Court was in the best interests of the company, and the members of the shareholders' committee had expressed their complete approval of the course of action taken. All liabilities incurred in connection with this litigation were provided for in the accounts.

Purely Chemical Manufacturers

The company were now purely chemical manufacturers in the so-called "heavy chemical trade," a trade which, when confined, as so far it was in their case, to comparatively few products, could not hold out any promise of great reward. Their competitors might well describe them as merely another unit in an already overcrowded sphere. Unwanted they might be, but was that so? Had they not proved that there was in fact a place in the industry for an independent concern? They were not pleading trade depression to explain away a loss or a drop in profits. On the contrary, although they did not minimise the effect upon their undertaking of the present state of trade, they had in face of that and in spite of every conceivable handicap, actually built up an entirely new business. They had secured a position in the market, had increased their turnover since last year, and for the first time were able to show a small profit. Their plant was up to date, and the reorganisation of the works forecast last year had been completed step by step. So far it had brought about a reduction of 35 per cent. in the standing and indirect charges of the works and of over 40 per cent. in manufacturing costs. Running, as at the present, at 50 per cent. capacity their plant could now earn a small net profit, and could he but visualise within the near future employment for their plant up to a 100 per cent. capacity he would venture to forecast an unusually large profit for their type of business.

Reorganisation Foreshadowed

Whatever the manufacturing policy might be, and whatever their commercial results, one glance at the balance sheet showed the inevitable need for a drastic reorganisation of capital. No scheme of reorganisation could be of real value unless a reasonable forecast could be given of its effect in relation to the earning power of the company. The directors would be in a position to recommend an equitable scheme for the shareholders' approval when they had had an opportunity of making a careful study of the working results of the first few months of the current year. He trusted, therefore, that he would not be asked at that meeting to give any indication of the principles upon which a scheme of reorganisation might be based, as it would be obviously futile to discuss immature suggestions. He was hoping that in the course of the coming summer they would be able to put a scheme before the shareholders and call the necessary meetings, when every opportunity would be given for discussion.

Chromium Plating Regulations

New Draft Issued

A NUMBER of objections to the draft chromium plating regulations under section 79 of the Factory and Workshop Act, 1901, which were issued on April 29 last, have recently formed the subject of discussion between the Factory Department and the objectors. As a result, H.M. Chief Inspector of Factories has now issued a revised draft in which it is hoped that practically all the objections which have been raised will be substantially met. The chief differences between the original and revised drafts are as follows:—

(*a*) In the original draft, Regulation 3 required that workers employed at a bath should be provided with rubber boots and with aprons and bibs of rubber or leather. The revised draft permits greater latitude as regards the materials to be used. (Several occupiers objected to the requirement of rubber gloves under this Regulation on the ground that they would be unsuitable in the case of persons employed in wiring and unwiring, but this requirement has always been limited to persons working at a bath and it was never proposed that the use of gloves should be required in other cases.)

(*b*) Regulation 5 (*a*) which was couched in general terms in the original draft has now been made more specific. The revised draft follows the terms of the corresponding Regulation which has been in force for some years in chemical works.

(*c*) A new Regulation (No. 6) requires the provision of drinking water. This requirement already applies to all factories and workshops in which 25 or more persons are employed, and also to various classes of works irrespective of the number employed.

(*d*) A new Regulation (No. 9) has been inserted, prohibiting the employment at baths of young persons under the age of 18.

Two other objections have been raised which it is proposed to meet, not by an amendment of the draft, but by subsequent administrative action:—

(i) It was suggested that there was not sufficient ground for applying Regulation 1 to anodic oxidation as well as to the plating process on the ground that in the former case the solution is so weak and the current density so low that the provision of exhaust ventilation is unnecessary. Further investigation has been made on this point and has shown the presence in some instances, of chromic acid in the air immediately over baths used for anodic oxidation in consequence of which it is not proposed to exclude this process from the scope of the Regulation. On the other hand it appears that in certain conditions the amount of acid in the air may be so small as to be harmless, and here it is proposed that the Chief Inspector should deal with such cases by exemption under the paragraph headed "Exceptions."

(ii) The fortnightly medical examination (Regulation 8 in revised draft) has been criticised as being over-frequent. In view of the rapidity with which the chromic acid affects the skin and mucous membrane of the nose, any general relaxation of this requirement is not advised, but the Chief Inspector will be authorised to extend the period between the examinations in particular cases if it is found after trial that this can be done without prejudice to the health of the workers concerned.

Copies of the revised draft may be obtained on application to the Factory Department, Home Office, London, S.W.1. Any objection with respect to these draft Regulations by or on behalf of any persons affected must be sent to the Secretary of State within 30 days from this date. Every objection must be in writing and must state (*a*) the draft Regulations or portions of draft Regulations objected to; (*b*) the specific grounds of objection; and (*c*) the omissions, additions or modifications asked for.

Chemical Manufacturers' Directory

LIKE its predecessors, the 1931 edition of "The Chemical Manufacturers' Directory" should be welcomed by the chemical-using industries, as this publication gives a considerable amount of information concerning the products which are actually prepared by the principal manufacturers. As with previous issues, chemicals are arranged alphabetically with cross references to the names of manufacturers. Under the latter headings are to be found addresses, telephone numbers, telegraphic addresses and other particulars that may be needed for quickly getting into touch with sources of supply.

Oil and Colour Chemists Association

Thirteenth Annual Dinner

THERE was a large attendance at the Connaught Rooms, Kingsway, London, on Friday, March 27, on the occasion of the thirteenth annual dinner of the Oil and Colour Chemists' Association and the 25th anniversary of the formation of the Paint and Varnish Society. The President, Mr. Noel Heaton, was in the chair and those present included Sir Charles Mander, Bart. (President, National Federation of Associated Paint, Colour and Varnish Manufacturers), Sir Harold Hartley (Director of Research, London Midland and Scottish Railways, Ltd.), Mr. George Gray (Vice-President, Institution of Chemical Engineers), Dr. G. C. Clayton (President, Institute of Chemistry), Mr. Eric Macfayden (President, Institution of the Rubber Industry), Mr. H. Goldstraw (Chairman, Technical Section, Papermakers' Association of Great Britain), Mr. C. A. Hindley (President, Incorporated Institute of British Decorators), Mr. Forrest Scott (hon. secretary), Mr. M. E. Dougherty (hon. treasurer), Mr. J. H. Aiken (General Secretary of the Oil and Colour Chemists Association), Mr. and Mrs. C. A. Klein, Dr. and Mrs. H. H. Morgan, and Dr. and Mrs. L. A. Jordan. Mr .S. K. Thornley (President, Research Association of British Paint, Colour and Varnish Manufacturers) and Dr. R. E. Stradling (Director, Building Research Station) were unable to attend.

Sir Charles Mander, proposing the toast of the Oil and Colour Chemists' Association, said he sincerely believed as a manufacturer that his bread and butter depended on the brains represented by the Association and the success of the paint and allied industries and their emergence from the present trough of depression would be due to the amount of research carried out by their chemists. Chemists, however, like inventors could be unsatisfactory people to deal with from the manufacturers point of view in that they would sometimes eliminate one fault by introducing others, and making expensive changes.

The Future of the Association

In his reply Mr. Noel Heaton said the ambition of their Association was to act as a link between scientific discovery and its practical application in their industry. By so doing they helped to maintain that prestige which had established the products of the British paint and varnish industry in every quarter of the globe. They preached the gospel of technical knowledge in the paint industry, and that was a good thing for the industry and a good thing for science. They aimed at making the term oil and colour chemist something to be proud of. He was in agreement with those who said the name of that Association was all wrong and that they should call themselves "Paint technologists" or something of the sort, but after all what did it matter what they called themselves as long as they did good work? A splendid spirit animated every one of their officers and members of Council and happy relations existed between the London Section and their very enterprising body in Manchester. Their work was by no means confined to the reading and discussing of papers. To mention one recent example the Association was invited to co-operate with the excise authorities in revising the regulations governing the use of methylated spirit. The special committee to whom that work was deputed carried it out with enthusiasm and presented a report which had been of assistance both to the excise and the industry. That Association embodied and carried on the ideal of good fellowship and understanding between the scientific and practical sections of the industry, on which the Paint and Varnish Society was founded.

Mr. A. Selby Wood, who proposed "The Guests," recalled a meeting of five years before, when they were considering the possibility of launching a research association, and obtaining the necessary financial and other support. Their object in starting it was that they might never be in the disgraceful position of certain of our national industries that had once been pre-eminent and had since fallen behind enterprising foreign competitors. Speaking on behalf of his fellow manufacturers, he could state that their enterprise had been fully rewarded by the progress of the Research Association under the guidance of Mr. S. K. Thornley, who had been fortunate in securing the services and the genius of Dr. Jordan. They had now arrived at another crucial period and during the next few months they had to decide what was going to be the fate of the research body in the ensuing five years. He appealed for similar enthusiastic support as on the last occasion.

Sir Harold Hartley, replying, said his experience had been that the more you put the chemist in complete control of research the more successful it was. He was fully aware of the importance of paint research in the great organisation with which he was connected, and had before now solicited Dr. Jordan's help. He had dabbled in the problems of the paint chemist himself and had been appalled at some of the difficulties which they were constantly facing and overcoming.

British Chemical Plant

Prospects for the July Exhibition

THE arrangements in regard to the British Chemical Plant Exhibition to be held at the Central Hall, Westminster, in conjunction with the jubilee celebrations of the Society of Chemical Industry from July 13 to 18, 1931, a preliminary announcement of which was made in January, are making rapid progress. Over 40 firms have already booked space, and since these include most of the important firms in the British chemical plant industry, the success of the exhibition is assured.

The exhibits will cover the whole range of the industry. Particular attention will be given to novel features which will receive prominence in the catalogue, so that the exhibition will constitute a unique opportunity for those who wish to see the latest developments in British chemical plant manufacture. Among the firms showing are the Aluminium Plant and Vessel Co.; Babcock and Wilcox; Thomas Broadbent and Sons; Brown Bayley's Steel Works; Burt, Boulton and Haywood; Cannon Iron Foundries; T. and C. Clark and Co.; The Dorr Co.; Thomas Firth and Sons; G.K.S. Combustion Co.; Grant and West; Gwynne's Pumps; Hadfields; G. A. Harvey and Co. (London); Hathern Station Brick and Terra Cotta Co.; W. C. Holmes and Co.; Huntington, Heberlein and Co.; Hydronyl Syndicate; Iuternational Electrolytic Plant Co.; Robert Jenkins and Co.; S. H. Johnson and Co.; Johnson Matthey and Co.; Kestner Evaporator and Engineering Co.; Lennox Foundry Co.; Manlove Alliott and Co.; L. A. Mitchell; Mond Nickel Co.; Negretti and Zambra; George Scott and Son; Siebe Gorman; Silica Gel; Thermal Syndicate; and James Walker and Co. The technical press is also well represented. This list speaks for itself and is the best guarantee of the value of the exhibition to anyone who is interested in plant and equipment for the chemical and allied industries.

Chemical Engineering Group Section

The arrangements which the Chemical Engineering Group is making for the section showing, on a co-operative basis, the work of the various research associations and of the Department of Scientific and Industrial Research are also well advanced. The scheme has received enthusiastic support from the department which will be represented by the National Physical Laboratory, the Chemical Research Laboratory, the Fuel Research Board, the Forest Products Research Laboratory, and the Building Research Board. The research associations are equally enthusiastic and those dealing with the following industries will co-operate:—Boots, Shoes and Allied Trades; Cast Iron; Leather; Linen; Non-Ferrous Metals; Paint, Colour and Varnish; Rubber; Wool. There will be three main groups dealing respectively with (i) materials used in chemical engineering such as metals, fabrics, etc., (ii) chemical plant and associated equipment including that employed on fuel, and (iii) testing apparatus and standardisation. Here, again, special attention will be given to novelties, and many of the exhibits bearing on the work of the above organisations will be on show for the first time.

The exhibition has already been given remarkable publicity in the foreign press, and the managing committee have received numerous inquiries from would-be visitors from all over the world. The publicity campaign both at home and abroad is now being intensified, so that, coupled with the jubilee celebrations of the Society, the exhibition will be assured of a large attendance of individuals who are vitally interested in the development of the chemical industry.

There is still a small amount of good space to be booked in the plant section and any firm desirous of exhibiting should make immediate application to the Secretary of the British Chemical Plant Manufacturers' Association, 166, Piccadilly, London, W.1.

Chemical Industry Lawn Tennis Tournament

Entry Lists Now Open

We have pleasure in giving below further particulars and the Rules for the Chemical Industry Lawn Tennis Tournament, a preliminary announcement of which was given in our last issue. The lists are now open and the last day for receiving entries will be Monday, May 4. All those desirous of competing, therefore, should immediately fill in the necessary particulars and forward the coupon printed below to the address given, at the earliest opportunity.

For the present the Tournament is limited to Men's Doubles and is open to all engaged in any capacity in the chemical industry throughout the country. Country members of the industry are cordially invited to compete, and endeavours will be made for teams to play off rounds in their own areas wherever possible; but players must, of course, be prepared to come to London to play off the final round. Two members of the same firm or of associated companies need but fill in the particulars necessary, and in due course they will find themselves drawn against an opposing pair. They arrange between themselves where their round is to be played off and the result is then forwarded to THE CHEMICAL AGE office, the winners being eligible for the next round, and so on, until the semi-final and final games are reached.

In addition to a challenge cup, to be held for the year by the firm represented by the winners, there will be two cups to be held by the winners themselves. Success for three years in succession by the same pair of players will entitle them to retain the cups as their own property.

THE RULES

1. Every competitor must be a member of the chemical trade, either as a principal or a member of a staff. There is no entrance fee of any kind.

2. Each pair must be members of the same, or an associated, firm.

3. The Challenge Cups shall be competed for annually on courts of any surface in accordance with the Rules of Lawn Tennis and the Regulations of the Lawn Tennis Association. The winners of the Cups shall make arrangements for their safe custody.

4. The Tournament will be conducted on the knock-out principle, and the best of three advantage sets will be played in all matches.

5. Entries shall be made not later than May 4, 1931, and addressed :

"Lawn Tennis Competition,"
The Chemical Age,
Bouverie House,
Fleet Street, London, E.C.4.

6. The draw shall be made on the first convenient day following the close of entries. The dates on or within which the several rounds must be played will be published in due course in THE CHEMICAL AGE.

7. The Publisher of THE CHEMICAL AGE shall have the right to scratch any players who fail to play off their matches by the stipulated dates, or who otherwise fail to conform with the arrangements made.

8. Except in the case of the special period set apart for the final stages of the Tournament, players drawn against each other must make their own arrangements for playing off their match on a court mutually agreed upon.

9. The result of each match must be sent to the Publisher of THE CHEMICAL AGE, signed by the winners and by the losers immediately after the match and must reach the office of THE CHEMICAL AGE not later than by the first post on the day following the final day for playing off the round.

10. If any player be not present at the agreed place or time of the match, the opponents shall be entitled to a walk-over, after having allowed reasonable time (say, a maximum of one hour) for the other's appearance. If the players find it impossible to play off their match on the day originally chosen, they must play it on any other day, to which they both agree, within the stipulated period.

11. Any dispute arising between players, or otherwise, shall be referred to the sole arbitration of the Publisher of THE CHEMICAL AGE, whose decision shall be final.

The Latest Date for Receiving Entries is May 4, 1931.

.....Cut along this line and post coupon as directed.....

Entry Form.

We have read the Rules of THE CHEMICAL AGE Lawn Tennis Tournament, and agree to abide by them.

Name of Competitor.....	*Name of Competitor*.....
Name of Firm.....	*Name of Firm*.....
Firm's Address.....	*Firm's Address*.....
.....	.....
Telephone No......	*Telephone No.*.....

Conference to Promote Better Roads

Road Tar Conference

THREE of the most important offices of the newly formed International Road Tar Conference are to be filled by British delegates. The Conference, which is attended by representatives from France, Germany, Great Britain, Switzerland and many other countries, has been called into being by the growing demand for improved road conditions, and the world-wide interest now displayed in road tar. The aim of the conference which, it is hoped, will ultimately embrace every tar-using country throughout the world, is to encourage research and experimental road work and to collect information relating to the use of tar in the construction and maintenance of roads, for dissemination among road experts of the various nations.

Sir David Milne-Watson, President of the British Road Tar Association has been elected president; Dr. Spilker, Germany, and Monsieur Laurain, France, vice-presidents, and Mr. Reginald G. Clarry, chairman of the British Road Tar Association, chairman of the executive committee. Mr. W. E. Cone, technical adviser of the association, is to be secretary of the conference. More tar is used in road work in Great Britain than in any other country in the world, and British methods of road construction are being followed with the closest attention by experts both in Europe and America as it is generally recognised that in the laying of tar this country leads the world. The headquarters and secretariat of the International Road Tar Conference are in the offices of the British Road Tar Association in London.

From Week to Week

DR. L. H. CRETCHER, who has been serving as head of the Mellon Institute's Department of Research on Pure Chemistry since 1926, has now been appointed to the post of an assistant directorship in that Institution.

THE QUEEN last week opened the Violet Melchett Infant Welfare Centre, in Chelsea. The land and the building were the gift of the late Lord Melchett to the Borough of Chelsea as a memorial to the work of Lady Melchett for the cause of infant welfare.

RUSTON AND HORNSBY, LTD., of Lincoln, announce that they have received an order for a six-cylinder Ruston vertical airless injection, cold-starting oil engine, of 600 b.h.p., which, it is believed, will be the largest in Scotland. It is for use by the Elgin Electric Supply Co.

A CONFIDENTIAL MEMORANDUM on methods of quoting and terms of payment customary in business with Roumania, prepared by the Commercial Secretary to H.M. Legation at Bucarest, has been received in the Department of Overseas Trade, and may be obtained on application to 35, Old Queen Street, London, quoting reference No. C.X. 3476.

THE EARL OF BESSBOROUGH, in consequence of his appointment as Governor-General of Canada, has resigned his position as joint chairman and member of the boards of Unilever, Ltd., and Unilever N.V. The boards of the two companies propose to appoint Mr. Anton Jurgens, in succession to Lord Bessborough, as joint chairman with Mr. F. d'Arcy Cooper.

LORD RUTHERFORD, addressing the Royal Institution on Friday, March 27, said it was possible that rich concentrations of helium might be found on the eastern slopes of the Rocky Mountains in Canada. A small gas field was found a few years ago not far from Toronto, and the rights of the wells had been secured for the University of Toronto in order to have an ample supply of helium for experiments in the laboratories.

FRIED. KRUPP GRUSONWERK, of Magdeburg, and the Andreas Machinery Manufacturing Co., of Muenster, both specialists in cement factory plant of many years' standing, have come to an arrangement as regards this particular branch of their activities. Krupp Grusonwerk are to take over the whole of the Cement Machinery Department of Andreas Co., while Mr. Andreas has undertaken to act as a technical adviser.

THE UNITED STATES BUREAU OF MINES, Department of Commerce, Washington, D.C., has just issued an informative circular (No. 6385), entitled "Nitrogen and Its Compounds." The scope of this publication covers occurrence of nitrogen and its compounds; uses of nitrogen and its compounds; mining and treatment of natural sodium nitrate; fixation of atmospheric nitrogen; by-product nitrogen; world nitrogen industry; nitrogen industry in United States; and the nitrogen industry in foreign countries.

FURTHER NEGOTIATIONS between workers and employers in the dyeing, bleaching and finishing and allied industries, took place at Manchester on Monday last in the hopes of arriving at a settlement of the wage reductions proposed by the employers. At the previous meeting the Employers' Federation of Dyers and Finishers reduced their demands to a 10 per cent. reduction, but this was refused by the workers' organisation. No final conclusions were reached on Monday, but there is now prospect of amicable settlement. The discussion was adjourned until Wednesday, April 8.

THE ATTENTION of British firms who may be making arrangements for their representatives to visit Empire markets is directed to the facilities and assistance which the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1, is in a position to render by furnishing letters of introduction to H.M. Trade Commissioners in the Dominions and Colonies. Should information as to general conditions in the markets in question be required, the Department is prepared to render any assistance possible either by letter or by personal interview. The information which can be afforded includes lists of importers, information as to the market for particular commodities, particulars of tariffs, names of likely agents, import statistics, etc.

RECENT WILLS include Mr. George Fairbrother Boome, of the Star Chemical Works, Bow, London, chemical manufacturer (net personalty £6,202), £6,856.

AT A GENERAL MEETING of the Royal Institution held on Monday, Sir Henry Miers, F.R.S., in the chair, Mr. C. L. Blackburn, Mr. Willard Connely, Mr. S. C. H. Goetze, Professor J. B. S. Haldane, Mr. T. G. N. Haldane, Mr. E. Ogden Ketting, Mr. F. Lydall, and Mr. C. H. Marshall, were elected members.

IN THE CHANCERY DIVISION on Monday, there was decided an action brought against the Ely Beet Sugar Factory, Ltd., concerning the discharge of beet-sugar effluent into the River Ouse, near Ely, where fisheries were owned by the plaintiff, Mr. C. T. Nicholls, of London. Plaintiff was awarded £200 damages.

A NITRATOR TANK exploded at the chemical works of J. W. Leitch and Co., Ltd., Milnsbridge, near Huddersfield, on Friday, March 27, and resulted in a process worker being splashed with acid and severely burned about the face and left arm. A slight fire was also caused, but was extinguished by the firm's staff.

THE DEPARTMENT OF OVERSEAS TRADE announce that Mr. Charles Kemp has been appointed to the additional post of H.M. Trade Commissioner at Nairobi. In future there will be two Trade Commissioner posts at Nairobi, of which the senior, as hitherto, will be filled by Colonel W. H. Franklin, C.B.E., D.S.O., and the junior by Mr. Kemp.

AT THE ANNUAL GENERAL MEETING of the shareholders of Reckitt and Sons, Ltd., of Hull, on Tuesday, Mr. W. H. Slack said the policy of the directors in establishing factories overseas had been fully vindicated. Works had been established in South Africa, Chili and Brazil, and owing to prohibitive duties they were arranging for factories in other countries.

A SLIGHT OUTBREAK OF FIRE occurred on March 28 at 86, Banner Street, London, E.C., premises occupied by W. H. Palmer and Co., Ltd., methylated spirit makers. It was attributed to wax boiling over. Due to mineral oil coming into contact with flame, there was another outbreak of fire on Monday at the premises of Amspac, Ltd., paint manufacturers.

A STOREHOUSE about 350 feet long and capable of holding 120,000 tons of arsenic, has recently been erected by the company working the Bolden mines in Sweden, which produce annually about 10,000 tons of arsenic. At present there is no market for this quantity and the company used to cast the arsenic obtained from the smelter, together with concrete, into blocks which were enclosed in wooden cases and towed out and sunk in deep water.

AT THE Institute of Science, Bangalore, a new laboratory has been constructed in which it is proposed to prepare the rarer chemicals required for research work. Not only are these very costly, but two or three months must elapse before they can be obtained from abroad, and work has to be suspended in the meanwhile. It is proposed to erect in the same laboratory most of the apparatus available for preparing plant extracts on a large scale and for recovering residues.

IT IS gratifying to find that the demand for artificial manures is rapidly growing in Bengal. After continuous experiments, it is discovered that these artificials yield the best results in combination with organic manures. Both in the case of paddy and jute, the two most important crops of Bengal, remarkable results have been obtained with artificials, in certain cases the increase reaching 50 per cent. Attempts are being made to introduce this manuring in mulberry cultivation, as it is found that thereby the cost of production of silk would be considerably reduced, an improvement which is urgently needed in the present depressed state of the silk industry in Bengal.

Obituary

MR. H. W. CROWTHER, formerly analytical chemist with Chance Brothers, Birmingham.

PROFESSOR H. RYAN, D.Sc., Professor of Chemistry at University College, Dublin, and State Chemist to the Irish Free State.

MR. WILLIAM REDELL JEROME, for nearly 70 years associated with S. Thornley, Ltd., drysalters, chemical and oil and colour dealers, of Snow Hill, Birmingham, aged 98.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

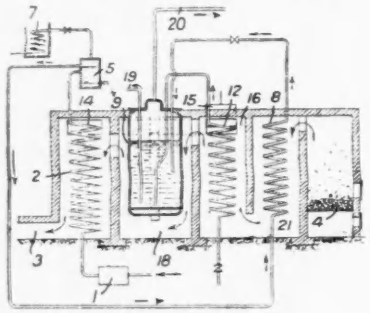
Abstracts of Accepted Specifications

340,334. DYES. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 1, 1929.

Pyrazol-anthrone-2-carboxylic acid halide or an N-alkyl or N-aralkyl derivative is condensed with a cyclic diketone capable of being vatted and containing at least one free amino group, in a diluent, and in presence of an acid binding agent. Alternatively, a 1-halogen-anthraquinone-2-carboxylic acid halide may be condensed with a diketone, and the product treated with hydrazine. Suitable di-ketones include α-mono- and diaminoanthraquinones, aminoanthramides, aminopyranthrones, aminodibenzanthrones, aminodibenzpyrene-quinones and their substitution products and derivatives. Examples describe the condensation of pyrazolanthrone-2-carboxylic acid chloride with 1-aminoanthraquinone, 1 : 4- or 1 : 5-diamino-anthraquinone, 1-amino-4-methoxyanthraquinone, 1-amino-4-benzoylamino-anthraquinone; N-methyl-pyrazolanthrone-2-carboxylic acid chloride with 1-aminoanthraquinone; and 4- or 5-chloro-pyrazolanthrone-2-carboxylic acid chloride with 1-aminoanthraquinone. Some alternative methods of obtaining the same products are also described.

340,370. DISTILLING OILS. Soc. Pour l'Exploitation des Procedes Abder-Halden, 5, Terrasse de la Pépinière, Nancy, Meurthe-et-Moselle, France. International Convention date, January 17, 1929.

Crude mineral oil is forced by a pump 1 through pre-heating coils, 2, 8 and then into a still 9. Steam is superheated in the



340,370

column 12 and passes into the still 9 to heat the oil. Water is separated in the vessel 5 and light vapour is recovered in a condenser 7. Vapour is drawn off from the still by pipe 20, and residual oil through pipe 19. The two preheating coils 2, 8, superheating coil 12, and still 9, are all heated by combustion gases from a furnace 4, which are controlled by a damper in the outlet 14.

340,435. ALKALINE EARTH CYANAMIDES. N. Caro, 97, Hohenzollerndamm, Dahlem, and A. R. Frank, 138, Kürfurstendamm, Halensee, both in Berlin. International Convention date, February 8, 1929.

Alkaline earth cyanamides are obtained from alkaline earth carbonates and synthetic ammonia in the presence of carbon monoxide. The hydrogen for the ammonia synthesis is obtained by the reaction of carbon monoxide and water. The process is effected by passing carbon monoxide and ammonia over alkaline earth carbonates, *e.g.*, calcium carbonate, yielding calcium cyanamide, carbon dioxide, and hydrogen. Ammonia and carbon dioxide are separated from the waste gases and the remaining carbon monoxide, hydrogen and nitrogen are passed into a hydrogen contact furnace where carbon monoxide reacts with water to form hydrogen and carbon dioxide. The unchanged carbon monoxide is separated and used for producing more cyanamide.

340,470. DESTRUCTIVE HYDROGENATION. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 28, 1929.

The process is for utilising acid residues from the refining of crude hydrocarbons with concentrated sulphuric acid or the solid products obtained in the condensation of middle to lubricating oils by the action of olefines in the presence of aluminium, zinc or ferric chloride. The acid residues are treated with a desulphurising agent such as Florida earth, iron oxide, or quicklime, and destructively hydrogenated at pressures from 5-1,000 atmospheres and temperatures of 300°-700° C. in the presence of catalysts such as oxides of molybdenum, tungsten, chromium, or cobalt sulphide, which are immune from sulphur poisoning. Examples are given of the treatment of a solid residue obtained by treating mineral oil with olefines in the presence of aluminium chloride, and a mixture of a residue from the refining of benzene with a residue obtained by treating an acid-refined oil with alkali.

340,475. ALUMINIUM SULPHATE. M. B. Robinson, and Alumina Co., Ltd., Iron Bridge Chemical Works, Widnes, Lancashire. Application date, August 23, 1929.

Ground uncalcined fireclay or shale in the proportion of 75-90 per cent. of the theoretical amount is added gradually to boiling sulphuric acid, the sp. gr. of which is maintained at 1·7 by adding weak liquor from previous operations. Burnt fireclay is then added to neutralise free sulphur trioxide and the sp. gr. is reduced to 1·5 by adding weak liquor and finally to 1·3 when passing to the settler. The solution is finally filtered through sawdust. The use of uncalcined fireclay retains the iron in light coloured ferrous form.

340,482. CARBON. W. W. Triggs, London. From Thomas Carbon Black Co., 525, Main Street, Orange, N.J., U.S.A. Application date, September 19, 1929.

Heavy oil distillates are cracked at low pressure and high temperature and mixed with gas formed during high pressure cracking. The mixed gas is incompletely burnt, yielding carbon black of high quality.

340,592. HYDROGENATING TAR OIL. A. S. Ramage, 7644, Woodward Avenue, Detroit, Mich., U.S.A. Application date, September 17, 1929.

Tar oil is heated to 700° F., expanded to precipitate pitch, and mixed with excess of water gas and passed through a tubular furnace packed with iron wool heated to 1100°—1200° F. The vapour is condensed, and the gas is separated and scrubbed with wash oil. The oil is saturated with benzol, etc., and is passed through a heat exchanger to a still. The benzol, etc., vapour is condensed and mixed with the condensate from the separator.

340,513. MOTOR SPIRIT. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 20, 1929.

Olefines are polymerised in the presence of catalysts consisting of phosphorus acids or their derivatives, or compounds which furnish such acids under the conditions of the reaction, in a solid or absorbed state. Salts of these acids may be used, particularly salts of aluminium, cerium, chromium, manganese, vanadium, or zinc, or acid sodium phosphate. The catalyst may be employed on a carrier such as active charcoal, Florida earth, or silica gel, and diluents may be present such as water vapour, hydrogen, nitrogen, carbon dioxide or methane. The temperature may be 200°—400° C. and the pressure 20—1000 atmospheres. If mixtures of olefines are treated, condensation and polymerisation may occur simultaneously. Products vary from butylene to gasolines which have exceptional anti-knocking properties, middle oils, and lubricating oils. The degree of polymerisation depends on the pressure, temperature, rate of flow and duration of treatment.

340,575. GELATINISING ORGANIC LIQUIDS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 4, 1929.

Neutral organic liquids such as aliphatic, aromatic or hydroaromatic hydrocarbons, *e.g.*, cyclohexane, benzene and its homologues, benzine and other paraffin hydrocarbons, esters, etc., ethyl acetate, ether, carbon tetrachloride, chloroform, or trichlorethylene are gelatinised for safe storage and transport

by forming in them a voluminous framework by the action of a base on abietic acid. In an example 0·5 kilogram of abietic acid is dissolved in 100 litres of cyclo-hexane and treated with gaseous ammonia or 0·5 litre of a 20 per cent. aqueous solution of ammonia. Other examples describe the treatment of acetone.

340,585. Destructive Hydrogenation. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, October 24, 1928.

Tar fractions containing carbazole are treated with hydrogen or gases supplying it at a pressure and temperature at which the carbazole is not decomposed (300°—550° C.) in the presence of a metal of the sixth group, or zinc, aluminium, manganese or their compounds. The product is cooled and filtered, or the low boiling constituents distilled off to obtain carbazole. An example is given of the treatment of anthracene residues and anthracene oil with hydrogen at a pressure of 200 atmospheres and temperature of 440° C. in the presence of a catalyst containing molybdenum, chromium and manganese.

340,587. Dehydrogenation of Hydrocarbons. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 30, 1929.

Aromatic hydrocarbons having at least one aliphatic side chain with at least two carbon atoms are vaporised and passed at high temperature over a dehydrogenating catalyst to obtain styrene and its homologues and polymers. The catalyst may be a difficultly reducible compound such as oxide of calcium, lithium, strontium, magnesium, beryllium, zirconium, aluminium, chromium, tungsten, molybdenum and uranium, molybdenum sulphide, aluminium phosphate, chromium phosphate, calcium aluminate, magnesium chromate, calcium uranate, anthracite, Florida earth, active carbon, silica gel, clay, phosphates, or phosphoric acid. The catalyst activity may be increased by adding copper or iron oxides. The catalyst may be pretreated with ethylene, acetylene, or benzene to ensure a long working life. The reaction is effected in an apparatus of porcelain or a copper-manganese alloy, or an enamel-lined substance. Examples are given of the treatment of ethyl-benzene, isopropyl-benzene, the product of the action of propylene on benzene, ethyl-toluene, diethyl-toluene and diethyl-benzene. Details are given of an alternative pretreatment of the catalyst.

340,682. Catalytic Hydrogenation and Dehydrogenation. Schering Kahlbaum Akt.-Ges., 170, Müllerstrasse, Berlin. International Convention date, November 29, 1928.

Dioxy-diphenyl-methane compounds are heated with cyclic alcohols to 220° C. in the presence of a hydrogenation catalyst whereby the dioxy-diphenyl-methane compound is split and hydrogen is taken up from the cyclic alcohol which is dehydrogenated to the ketone. Examples are given of the reaction of 4 : 4^1-dioxy-diphenyl-methyl-methane and cyclo-hexanol to obtain *p*-ethyl-phenol, phenol and cyclohexanone; 4 : 4^1 dioxy-diphenyl-dimethyl-methane and cyclo-hexanol to obtain *p*-isopropyl-phenol, phenol and cyclo-hexanone; 2 : 2^1-dioxy-4 : 4^1-dimethyl-diphenyl-dimethyl-methane and cyclohexanol or methyl-cyclohexanol to obtain thymol with *m*-cresol and cyclohexanone or methyl-cyclohexanone.

340,736. Purifying Sulphur Dioxide. Metallges. Akt.-Ges., 45, Bockenheimer Anlage, Frankfort-on-Main, Germany. International Convention date, February 1, 1929.

Sulphur-containing ores such as zinc blende are roasted, and the gases passed through a second roasting furnace to remove combustible impurities such as arsine. The resulting arsenic trioxide is recovered by sulphuric acid washing or by a high tension electrostatic field. The first roasting may be effected in a Spirlet furnace at 800° C., the sulphur being reduced to 8 per cent., and the ore completely desulphurised in a Dwight-Lloyd apparatus. The gases from the latter are passed through the first furnace to burn the arsine, and may then be used in the sulphuric acid contact process.

340,787. Purification of Acetylene. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, January 16, 1929.

Carbonaceous substances are treated in the electric arc to obtain gases containing acetylene and also impurities such as di-acetylene, ethylene, allylene, butylene, isoprene, butadiene and cyanogen compounds. The cyanogen compounds are removed by washing with solutions of ferrous sulphate, caustic soda or potash, and the gases are then passed over active carbon or silica to remove other impurities. The gas is then suitable for conversion into acetaldehyde or acetic acid by means of sulphuric acid containing mercury as catalyst.

340,816. Recovering Waste Sulphuric Acid. Chemische Fabrik Bork Ges., Bork, near Essen, and J. Grubenbecher, 4, Olbrichstrasse, Essen, Germany. Application date, January 23, 1930.

Sulphuric acid which has been used for washing mineral and tar oils is purified by passing through a tower in counter-current to the vapours of one-eighth part by volume of acid tar oils of medium boiling point, such as phenols or higher benzene homologues. The resinous impurities in the acid separate in the condensed vapour above the acid. Water is then added to dilute the acid to sp. gr. 1·5—1·55, and any remaining resins, acid tar condensates, and lighter hydrocarbons separate above the acid.

Specifications Accepted with Date of Application

344,404. Preventing the solution of metals in acids. J. H. Gravell. October 26, 1929.

344,406. Vulcanising rubber. A. C. Burrage. October 29, 1929.

344,409. Intermediates and dyes from heterocyclic nitrogen compounds, Manufacture of. Imperial Chemical Industries, Ltd., H. A. Piggott and E. H. Rodd. November 4, 1929.

344,413. Synthetic resins, Manufacture of. British Celanese, Ltd. November 26, 1928.

344,420. Organic substitution derivatives of cellulose, Manufacture of. H. Dreyfus. November 28, 1929.

344,443. Conversion of methane to liquid hydrocarbons by thermal treatment, Process and apparatus for. Naamlooze Vennootschap Silica en Ovenbouw Mij, and C. Otto. November 27, 1929.

344,449. Ketones, Production of. Holzverkohlungs-Industrie Akt.-Ges., January 25, 1929.

344,470. Conversion of acetylene into higher boiling hydrocarbons. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. November 13, 1928.

344,479. Ketones, Manufacture of. H. Dreyfus. November 28, 1929.

344,488. Organic substitution derivatives of cellulose, Manufacture of. H. Dreyfus. December 2, 1929.

344,491. Preservation of natural and synthetic indiarubber. A. Carpmael (*I.G. Farbenindustrie Akt.-Ges.*) December 2, 1929.

344,492. Recovering metals from metalliferous materials. Meyer Mineral Separation Co. December 28, 1928.

344,500. Alloys. Sir R. A. Hadfield. December 5, 1929.

344,532. Organic arsenic and antimony compounds. I.G. Farbenindustrie Akt.-Ges. February 21, 1929. Addition to 318,491.

344,545. Concentrated caustic alkali lyes, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 15, 1928.

344,554. Catalytic production of acetaldehyde. G. B. Ellis. (*C. F. Boehringer and Soehne Ges.*) December 16, 1929.

344,558. Vat dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 17, 1928.

344,569. Producing coked metalliferous agglomerates. New Jersey Zinc Co. July 30, 1929.

344,570. Coking of metalliferous agglomerates. New Jersey Zinc Co. September 11, 1929.

344,570. Catalytic gaseous reactions, Process and apparatus for. Dupont Ammonia Corporation. December 31, 1928.

344,592. 1:1:2-Trichlorethane, Production of. I.G. Farbenindustrie Akt.-Ges. January 31, 1929.

344,601. Anhydrous chlorides, Process and apparatus for the production of Soc. de Produits Chimiques des Terres Rares. January 18, 1929.

344,627. Alkylated 3:6-diamino-acridimium compounds, Process for the manufacture of. I.G. Farbenindustrie Akt.-Ges. February 12, 1929.

344,638. Acetaldehyde and acetic acid from acetylene, Production of. C. C. Tanner and Imperial Chemical Industries, Ltd. February 20, 1930.

344,647. Latex, Concentration and purification of. Nangatuck Chemical Co. March 16, 1929.

344,675. 3-Ethoxy-4-oxybenzaldehyde, Manufacture of. I.G. Farbenindustrie Akt.-Ges. and W. W. Groves. March 15, 1930. Addition to 219,676.

344,690. Aldehyde-amines, Treatment of. Nangatuck Chemical Co. April 17, 1929.

344,761. Cellulose nitro-acetates, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 11, 1929. Addition to 319,285.

344,480 and 344,529. Organic substitution derivatives of cellulose, Manufacture of. H. Dreyfus. November 28, 1929.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co. Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, April 1, 1931.

THE market is steady with prices unchanged. There is nothing of special interest to report.

General Chemicals

ACETONE.—The demand is satisfactory at £60/63, according to quality.

ACID ACETIC.—Unchanged at £36 5s. to £38 5s. for technical 80%, and £37 5s. to £39 5s. per ton for pure 80%, with a steady demand.

ACID CITRIC.—Still weak at about 1s. 1d. to 1s. 1¾d. per lb., less 5%.

ACID FORMIC.—85% technical, £38 5s. per ton, and in good demand.

ACID LACTIC.—Steady at about £39 to £40 per ton for the 50% by weight, pale quality.

ACID OXALIC.—Firm at £30 7s. 6d. to £32 per ton, according to quantity, and in good request.

ACID TARTARIC.—11¾d. to 1s. per lb., less 5%. The improvement in the demand continues.

ALUMINA SULPHATE.—£7 15s. to £8 5s. per ton for the 17/18% iron free quality, and in steady request.

ARSENIC.—Continues firm at £19 to £19 10s. per ton.

BARIUM CHLORIDE.—£9 10s. to £10 per ton, with an improved demand.

CREAM OF TARTAR.—In steady demand at 82s. to 84s. per cwt. ex warehouse, London.

COPPER SULPHATE.—Steady at about £22 to £22 10s. per ton, less 5%, free on rails London.

FORMALDEHYDE.—In good steady request at £30 to £30 10s. per ton.

LEAD ACETATE.—Although pig lead is weak, lead acetate has not been reduced, and the price remains unchanged at £34 5s. per ton for white, and £1 per ton less.

LEAD NITRATE.—About £29 10s. per ton.

LITHOPONE.—Steady at £18 to £22 per ton, according to grade and quantity.

BICHROMATE OF POTASH.—Continues firm and in steady demand at 4¼d. per lb., with usual discounts for contracts.

POTASSIUM CHLORATE.—Firm at about £28 to £30 per ton.

PERMANGANATE OF POTASH.—5¼d. to 5½d. per lb., ex wharf London, with a good steady call.

SODA BICHROMATE.—Firm at 3¾d. per lb., and in steady demand.

SODA CHLORATE.—The position continues very firm at £26 10s. per ton, with a good steady demand.

SODA HYPOSULPHITE.—Photographic crystals, £14 5s. per ton. The improved demand continues. Commercial quality quiet at about £8 10s. per ton.

SODA YELLOW PRUSSIATE.—Continues firm at 4¾d. to 5½d. per lb., according to quantity.

TARTAR EMETIC.—The demand is increasing at 10¾d. to 11d. per lb.

ZINC SULPHATE.—Unchanged at £11 to £11 10s. per ton.

Coal Tar Products

THE market for coal tar products remains unchanged, with very little interest.

MOTOR BENZOL.—Quoted at 1s. 4½d. to 1s. 5½d. per gallon, f.o.r.

SOLVENT NAPHTHA.—Quoted at 1s. 1½d. to 1s. 2d. per gallon, f.o.r.

HEAVY NAPHTHA.—Offered at 11d. to 1s. 0½d. per gallon, f.o.r.

CREOSOTE OIL.—Unchanged at about 3d. to 3½d. per gallon, f.o.r. in the North, and at about 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Remains at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Unchanged at £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Worth about 37s. 6d. to 40s. per ton, f.o.b. East Coast port.

THE following additional note on prices has been received :—

Business is a little quiet at the moment on account of near approach of the holiday season, coupled with the fact that purchases are being confined to a minimum till Budget day is over.

CARBOLIC ACID.—There is no change to report, prices being the same ; 5 ton lots at 5½d., small quantities at 6¼d. per lb., all in bulk packing.

ASPIRIN.—Unchanged at 2s. 7d. to 2s. 9d. per lb.

VANILLIN.—The new prices are becoming established, and while a certain amount of stocks are in second hands, it is really thought that these are not as large as originally anticipated.

METHYL SALICYLATE.—1s. 3d. to 1s. 5d. per lb.

CRESYLIC ACID.—Pale 97/99% is quoted at 1s. 6d. to 1s. 7d. per gallon ; 99/100% at 1s. 11d. to 2s. 3d., according to quantity. Dark 95% is offered at 1s. 4½d. to 1s. 5½d. per gallon, naked at seller's works.

Nitrogen Fertilisers

Sulphate of Ammonia.—Export.—Conditions in this market are about the same as in the previous week. Although there have been reports that buyers were manifesting more interest in this product, there has apparently been no increase of consequence in demand. The price remains steady at about £7 per ton f.o.b. U.K. port in single bags for neutral quality 20·6% nitrogen. *Home.*—A very brisk demand has been reported from the North and from Scotland, but in the South of England we understand that sales are much smaller than last year.

Nitrate of Soda.—Scale prices remain in operation. It is understood that the deliveries to consumers are, like those of sulphate, below last year's level.

Latest Oil Prices

LONDON, March 31.—LINSEED OIL was in fair request at irregular prices. Spot, £18 10s., ex mill ; April, £16 15s. ; May-August, £17 5s. ; September-December, £18 2s. 6d., naked. RAPE OIL was inactive. Crude extracted, £30 10s. ; technical refined, £32, naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £21 10s. ; refined common edible, £25 10s. ; deodorized, £27 10s., naked, ex mill. TURPENTINE was quiet and 6d. per cwt. lower. American, spot and April, 40s. ; May-June, 40s. 6d. ; Russian, spot, 37s.

HULL.—LINSEED OIL.—Naked, spot, closed at £17 ; May-August, £17 7s. 6d. ; September-December, £18 2s. 6d. ; Baltic, spot, unquoted. COTTON OIL, Egyptian, crude, spot, £21 ; edible, refined, spot, £24 ; technical, spot, £23 15s. ; deodorized, £26. CASTOR OIL, pharmacy, spot, 41s. 6d. ; firsts, 36s. 6d. ; seconds 34s. 6d. (per cwt.) ; PALM KERNEL OIL, crude, naked, 5½ per cent., spot, £24. GROUNDNUT OIL, crushed-extracted, spot £25 10s. ; deodorized, £29 10s. SOYA OIL, crushed-extracted, spot, £20 ; deodorized, £23 10s. RAPE OIL, crushed-extracted, spot, £30 ; refined, £32. COD OIL, nominal, at 20s. per cwt. TURPENTINE, 42s. 6d. per cwt.

South Wales By-Products

THERE is very little change in South Wales by-product activities. With the patent fuel industry in a depressed condition the call for pitch is uncertain, supplies being well in excess of demands. There is no change in values. Road tar has a fair, steady call round about 13s. per 40-gallon barrel. Refined tars have also a fair call, with quotations unchanged for coke-oven and gasworks tar. Napthas have only a small demand, solvent and heavy holding unchanged values. Patent fuel prices, for export, are : 20s. 6d. to 21s., ex ship Cardiff ; 19s. 6d. to 20s., ex ship Swansea and Newport. Coke prices are : Best foundry, 34s. to 36s. 6d. ; good foundry, 22s. 6d. to 25s. ; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

SOME improvement is noticeable in the throughput of almost all products, and although values continue rather easy at present, there is not the same tendency on the part of dealers to "bear" the markets as prices are now considered to be very keen.

Cresylic Acid.—In order to induce business quotations have been lowered. Pale, 99/100%, 1s. 5d. to 1s. 6d. per gallon ; pale, 97/99%, 1s. 4d. to 1s. 5d. per gallon ; dark, 97/99%, 1s. 3d. to 1s. 4d. per gallon, all f.o.r. naked ; high boiling is unchanged at 1s. 8d. to 1s. 9d. per gallon.

Carbolic Sixties.—Dull, with value nominal at 1s. 4d. to 1s. 6d. per gallon.

Creosote Oil.—Production is not great and values are steady. Specification oils, 2½d. to 3d. per gallon ; gas works ordinary, 3½d. to 3¾d. per gallon ; washed oil, 3d. to 3¼d. per gallon ; all f.o.r. in bulk.

Coal Tar Pitch.—Value is nominal at 40s. per ton, f.a.s. Glasgow, for export, and about 42s. 6d. per ton, f.o.r. works, for home trade.

Blast Furnace Pitch continues in moderate call for home trade. Controlled prices remain at 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Competition is keen, but quotations are unchanged at 2½d. to 2¾d. per gallon f.o.r. naked.

Blast Furnace Tar.—Without interest at 2¾d. per gallon f.o.r.

Crude Naphtha.—Steady, with supplies rather scarce. Value is 4½d. to 4¾d. per gallon ex works.

Water White Products.—Little business is being transacted and prices are irregular. Motor benzol is 1s. 3d. to 1s. 4d. per gallon ; 90/160 solvent, 1s. 2d. to 1s. 3d. per gallon ; 90/190 heavy solvent, 1s. to 1s. 0½d. per gallon ; all f.o.r. works in bulk.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, March 31, 1931.

CONTINUED improvement is noted in the Scottish heavy chemical market.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at the same price, viz.: 3¼d. per lb., ex store. On offer from the Continent at 3⅛d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality; £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11¾d. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 1s. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. od. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—10¼d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £28 per ton, ex wharf. On offer for shipment from China at about £27 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £22 10s. per ton, ex wharf. Spot material still on offer at £22 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £30 10s. per ton, ex store. Continental on offer at about £29 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £32 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £42 per ton, carriage paid.

LEAD, ACETATE.—White crystals quoted round about £34 to £35 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 7s. 6d. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99⅜/100% POWDER.—Quoted £29 per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums, all carriage paid buyer's station, minimum four-ton lots. For contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 15s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £19 per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Tar for Road Purposes

British Standard Specification

THE British Engineering Standards Association has published a further specification for road tar, designated "Tar No. 3." This specification, the draft of which was prepared by the British Road Tar Association, provides for a tar suitable for the manufacture of tarmacadam laid by the hot or semi-hot process, as an alternative to "Tar No. 2," contained in B.S. Specification No. 76—1930, and its viscosity is higher than that of the latter tar. The methods of testing and specifications for apparatus which are given as appendices have been prepared by the Standardisation of Tar Products Tests Committee and are based on this Committee's publication "Standard Methods for Testing Tar and its Products."

Copies of the new specification (No. 76, Part 2–1931) may be obtained from the British Engineering Standards Association, Publications Department, 28, Victoria Street, London, S.W.1, price 2s. 2d., post free.

Marking of Imported Fertilisers

WITH reference to the notice issued on January 22, the Board of Trade announce that a new Order in Council under the Merchandise Marks Act, 1926, entitled the Merchandise Marks (Imported Goods) No. 7 Order, 1931, was made on March 20, 1931. The Order, which requires imported fertilisers and feeding stuffs of the descriptions specified therein to bear an indication of origin on importation into, and sale and exposure for sale in, the United Kingdom, comes into force on June 20, 1931. The text of the Order in draft form was published in the Board of Trade Journal of January 22, 1931. The Order in Council as made is being published, and copies will be purchasable in due course either directly from the Stationery Office, or through any bookseller.

Weekly Prices of British Chemicals

THE prices of British Chemical Products remain unchanged, except for the following alterations in Essential Oils:—

Anise Oil.—2s. 9d. per lb.

Cassia Oil 80/85%.—4s. per lb.

Lemon Oil.—4s. 3d. per lb.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, April 1, 1931.

The chemical market, in the majority of sections, fully retains the steadiness that has been a feature for some time, and price movements since last report have been confined to relatively unimportant fluctuations. Any measure of caution in buying activity is, therefore, less a question of price than of conditions at the consuming end of the trade. The demand during the past week, taking the market as a whole, has been on a moderate scale, with new business largely a matter of parcels for near delivery dates and current inquiry restricted to the same positions. Between now and the end of next week trade is likely to be on narrow lines.

Heavy Chemicals

The call for prussiate of soda this week has been rather quiet, but quotations in this section are well held at from 4¾d. to 5¼d. per lb., according to quantity. Bichromate of soda is moving off in moderate parcels, and values are maintained on the basis of 3½d. per lb., less 1 to 2½ per cent. In the case of hyposulphite of soda the demand is inactive, but there has been little alteration in the price basis of this material, the commercial grade being on offer at round £9 per ton and the photographic quality at £15 10s. Bicarbonate of soda meets with a quietly steady demand at about £10 10s. per ton, in contracts. There is a limited inquiry about for phosphate of soda, with the dibasic quality on offer at up to £10 10s. per ton. Saltcake is steady, with current values ranging from about £2 15s. to £3 per ton. Caustic soda is reported to be moving fairly steadily into consumption, and contract quotations are firm at from £12 15s. to £14 per ton, according to grade. Alkali is firm on the basis of £6 per ton, and a moderate weight of business in this material is being put through. Only a quiet trade is reported this week in the case of sulphide of sodium, but values keep up at round £9 10s. per ton for the 60-65 per cent. concentrated quality and £8 for the commercial. Chlorate of soda is about unchanged at £26 10s. per ton.

Buying interest in permanganate of potash has been limited to small parcels, but offers keep up at about 5¼d. per lb. for the commercial kind and 5½d. for the B.P. quality. Yellow prussiate of potash is in moderate request and prices are firm at from 6¾d. to 7¼d. per lb., according to quantity. A fair business is going through in caustic potash, offers of which are at from £28 10s. per ton upwards. Carbonate of potash is in quiet demand at about £25 10s. per ton. Chlorate of potash is quiet, but prices keep steady at about £27 10s. per ton. There is a moderate inquiry about for bichromate of potash at 4¼d. per lb., less 1 to 2½ per cent.

Arsenic maintains its steady tone, and at round £19 per ton at the mines for white powdered, Cornish makes, there has been little actual change in prices compared with a week ago. The demand for sulphate of copper is below normal and the price position is not too strong; offers to-day are in the neighbourhood of £20 per ton, f.o.b. Sales of the acetates of lime are slow, with brown quoted at from £7 5s. to £7 10s. per ton and grey at £13. Nitrate of lead is inactive at round £29 per ton, with brown and white acetate at £32 and £33 10s.

Acids and Tar Products

Citric acid is attracting moderate attention at down to about 1s. 0½d. per lb. Tartaric acid is offered at from 11¼d. to 11½d. per lb., with buying on a limited scale. Oxalic acid is fairly steady at round £1 12s. per cwt., ex store, a quiet business being put through. Acetic acid maintains its firmness at about £51 per ton for the technical glacial quality and £37 for the commercial 80 per cent., a quietly steady demand being met with.

Current pitch prices are at from about 37s. per ton, f.o.b., with the demand tapering off. Only a relatively quiet business is passing in creosote oil, and at 3¼d. to 4¼d. per gallon, naked, values are not too strong. There is a fair call for crystal carbolic at about 5¼d. per lb., f.o.b., with crude 60's material on offer at 1s. 2d. per gallon, naked. Solvent naphtha meets with a moderate demand, with current values at round 1s. 2d. per gallon, naked.

Company News

Burt, Boulton and Haywood, Ltd.—An interim dividend of 4%, less tax, is payable on April 16.

Hadfields, Ltd.—No dividend, it is reported, is to be paid for 1930 on the 1,859,784 £1 ordinary shares of the company.

Kaliwerke Westeregeln.—It is announced that the board of the Kaliwerke Westeregeln proposes to raise its capital by Rm. 1,000,000 to Rm. 23·2 millions on account of the merger with the Kaliwerke Siegmundshall.

Rosario Nitrate Co.—Extraordinary general meetings have been called of the Rosario Nitrate Co. on Wednesday, April 22, and of the New Paccha and Jazpampa Nitrate Co. and San Sebastian Nitrate Co. on April 23 to approve agreements for the sale of the companies to "Cosach."

Tharsis Sulphur and Copper Co.—The report for the year 1930 states that the net profit was £131,015, which, with the amount brought forward of £24,878, makes £155,893. The directors recommend a dividend of 10 per cent., absorbing £125,000, leaving a balance to be carried forward of £30,893.

British Enka Artificial Silk Co., Ltd.—The report of the directors for the year ended December 31, 1930, shows a working loss of £72,139, to which is added debenture interest and sundry items totalling £19,215, and £75,253 for depreciation of buildings, plant, etc., making the total loss for the year £166,607. Redemption of £12,400 of the outstanding debentures was made on September 30 last in accordance with the terms of issue.

Dominion Tar and Chemical Co.—The full report now issued shows profit before depreciation of $1,681,683. Deducting depreciation $500,380, debenture interest $286,331, dividends paid and declared on preferred shares of Dominion Tar, and Alberta Wood Preserving Co., $356,729, and income-tax $74,000, there remains a net balance of $464,244. After allowing for reserves provided by subsidiary companies, surplus is increased to $991,047. During the year the Dominion Tar and Chemical Co. acquired outstanding shares of Calders (Canada), Ltd., and further shares of Canada Creosoting Co., Ltd., and Alberta Wood Preserving Co., Ltd.

United Molasses Co.—The report for 1930 shows that the general trade depression has had a serious effect on the earnings of the company and its subsidiary undertakings. A consolidated statement of the results shows that the total profits of the company and subsidiaries, after charging expenses and foreign taxation, but before depreciation and the reduction in value of stocks on hand, amounted to £812,225, against £1,257,054, after depreciation, in 1929. From this is deducted £342,262 for depreciation, leaving £469,962, and after deducting subsidiaries' income-tax and their profits for the year (£218,189) and the proportion of loss in a subsidiary accrued prior to acquisition, £7,349, the net profit of the parent company is shown at £229,075, which compares with £1,146,458. After charging income-tax and preference dividend, and adding the amount brought in, there is £145,588, to which is added the balance of accumulated profits in subsidiary and associated companies, £305,398, making £450,987.

Allied Chemical and Dye Corporation.—The net income amounted in 1930 to $25,103,539 after all charges, including depreciation, taxes, repairs, etc. After preferred dividends, this is equivalent to $9.77 per share of common stock on the 2,286,980 shares outstanding at the end of the year, and compares with net income for 1929 amounting to $30,198,523, which was equivalent to $12.60 on the 2,178,109 common shares outstanding at the end of that year. Total assets increased by $14,621,008 to $402,234,528, including a net increase in the property account of $16,820,339. Holdings of cash, United States Government and other liquid securities, increased by $516,471 to $113,320,484. Current assets at $155,451,336 at the year end were 17.8 times current liabilities at $8,715,056. The addition to surplus after payment of cash and stock dividends amounted to $7,927,715. Government and other marketable securities carried at cost—$92,982,868—in the balance sheet, had a market value at the year end substantially in excess of cost. No part of the year's income was derived from the sale of securities.

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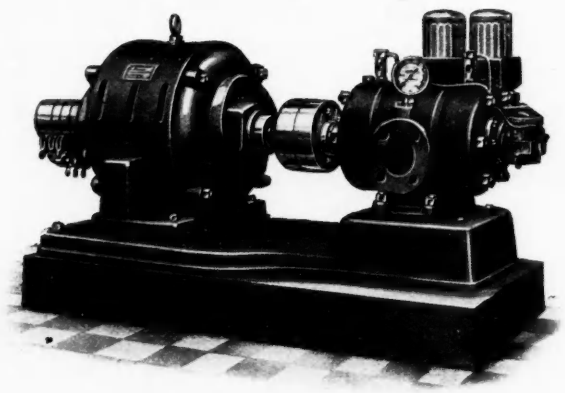

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New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to April 25, 1931.

PUTNAM.

Advertised before acceptance, the Applicants alleging distinctiveness.

518,263. Class 1. Mineral dyes. Monroe Chemical Co., Ltd., 46, Holborn Viaduct, London, E.C.1; manufacturers and merchants. November 29, 1930.

MARGOL.

520,156. Class 1. Fluid for the prevention and removal of scale in boilers. Gustave Emile de Brunner, trading as De Brunner and Lang-Sims, 3/4, King Street, Covent Garden, London, W.C.2; merchant. February 7, 1931.

IGEPON.

520,340. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. I.G. Farbenindustrie Aktiengesellschaft (a Joint Stock Company organised under the laws of Germany), Mainzer-Landstrasse 28, Frankfurt-on-Main, Germany; manufacturers. February 13, 1931.

OLIGAN.

520,513. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives. Society of Chemical Industry in Basle (a Joint Stock Company, organised under the laws of Switzerland), 141 to 227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants. February 19, 1931.

AVOLEUM.

520,609. Class 3. Chemical substances prepared for use in medicine and pharmacy. The British Drug Houses, Ltd., 16 to 30, Graham Street, City Road, London, N.1; wholesale druggists. February 24, 1931.

Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

BELGIUM.—An agent at Huy (Liége district) wishes to represent British manufacturers of industrial chemicals. (Ref. No. 259.)

NEW ZEALAND.—The Government Stores Control Board is calling for tenders to be presented in Wellington by May 25 for the supply of disinfectant fluid. (Ref. F.X. 1,073.)

EGYPT.—The Department of Public Health, Cairo, is inviting tenders to be presented by May 25, for the supply of crude oil, paint, varnish, soft soap, soda, hardware, etc., required during the year 1931/1932. (Ref. No. C.X. 3499).

Tariff Changes

NORTHERN RHODESIA.—A Government Notice provides for a grant of a rebate of the whole of the Customs duties on fuel or fuel oils, beeswax, powdered glue and cartridges.

CZECHOSLOVAKIA.—An Order, effective as from February 18, contains a schedule of valuations for the assessment of the duty of 15 per cent. *ad. val.* in respect of certain important chemical auxiliary materials and products. The valuations represent the average values of the products per 100 kilogs. net.

New Price List of Fine Chemicals

A NEW price list of chemicals and pharmaceutical specialities has just been issued by May and Baker, Ltd., of Battersea, London. This list is conveniently indexed on the tab system for quick reference. It also contains a useful supplement of explanatory notes on the composition of certain products mentioned, together with a comprehensive index of synonyms and trade names.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette, &c.

Company Winding Up Voluntarily

BRITISH FUEL PRODUCTS, LTD. (C.W.U.V., 4/4/31.) By reason of its liabilities, March 25. G. Elder Levie, of Finsbury Pavement House, London, E.C.2, appointed liquidator of the company. Creditors' claims to liquidator by May 9.

New Companies Registered

CARNEGIE BROS., LTD., 227-229, Essex Road, Islington. Registered March 26. Nominal capital, £40,000 in £1 shares. Manufacturing, wholesale and retail chemists, etc. Directors: R. B. Carnegie, D. M. Carnegie.

J. H. DYSON AND SON, LTD.—Registered March 30. Nominal capital, £20,000 in £1 shares (10,000 5 per cent. non-cumulative preference and 10,000 ordinary). Manufacturers of and wholesale and retail dealers in soap, cleansing and scouring powders, boot and shoe polishes, metal polishes, floor stains and polishes, shellacs, dyewares, etc. Directors: J. H. Dyson, Grey Gables, Greenroyd, Halifax; Mrs. Florence Dyson.

IMPROVED EMULSIFICATION PROCESS CO., LTD., Napier House, 24/7, High Holborn, London, W.C.1. Registered March 26. Nominal capital, £2,000 in £1 shares. Manufacturers of and dealers in machinery for making emulsions and other mixtures, etc. Directors: Dr. V. G. Walsh, V. A. Collins, W. E. Lewis, H. J. Collins.

RADIUM IMPORTS, LTD., 153, Regent Street, London, W.1. Registered March 25. Nominal capital, £5,000 in 4,000 10 per cent. preference shares of £1 each and 20,000 ordinary shares of 1s. each. To acquire the business of the sale of radium compresses and other radio products now carried on by Dr. C. Z. Holub and H. N. Knowles, at 153, Regent Street, London, W.1. Directors: C. Z. Holub, H. N. Knowles, D. H. C. Higgins.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

165. GROUND OYSTER SHELLS—A chemical firm desire to know of industries using finely ground oyster shells. "In the course of trading in fertilisers and feeding stuffs," they write, "we handle quite large quantities of ground oyster shells which we distribute in wholesale quantities mostly in the poultry-feeding trade. It has come to our knowledge that very finely ground oyster shells or oyster shell powder is now being utilised fairly extensively for sundry manufacturing purposes. We have, however, not been able to ascertain in what industries it is being employed, and we write to ask you whether you may have any information on the subject."

Norwegian Kelp Production

NORWEGIAN producers of kelp ash reported very unsatisfactory results for the quarter ended September 30, although total production for the first nine months of the year is to all appearances practically the same as that of the same period of 1929.

According to the latest official export figures, exports of kelp ash during the first eight months of the year were 2,261,498 kilos as compared with 2,400,249 kilos in the corresponding period of 1929. It has been estimated by one of the leading exporters of kelp ash that about 500,000 kilos were exported during the month of September this year, making the estimated total exports for nine months, to include September, approximately 2,900,000 kilos, as against 2,448,977 kilos in the like period of 1929. It is stated that the quality of the ash is somewhat inferior to last year's because of the carelessness of the seaweed burners, especially in the northern districts of Norway. No change in price is noted.—U.S. Consul George Orr, Stavanger.